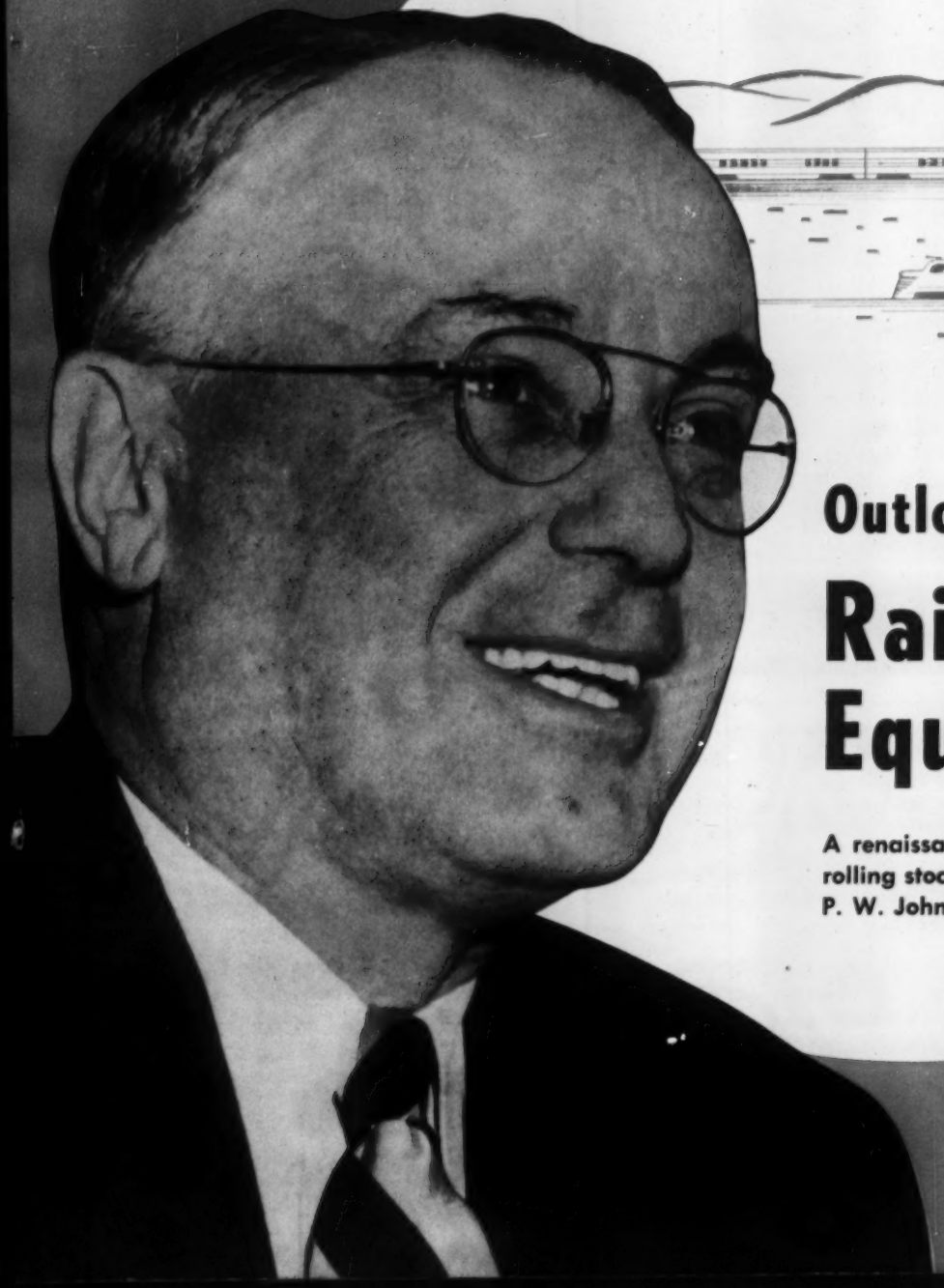
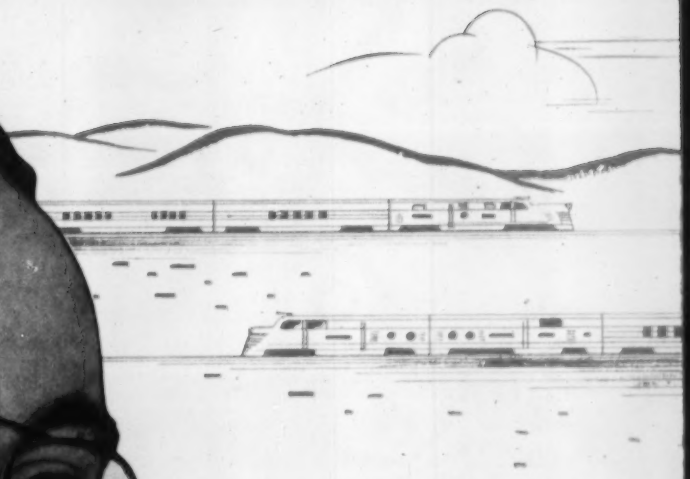
JUNE 6, 1955

STEEL

The Metalworking Weekly





Outlook for Railroad Equipment

A renaissance brings big changes in rolling stock, maintenance, says Erie's P. W. Johnston **—page 57**

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AN IMPORTANT MESSAGE CONCERNING...

A Basic Advance In Motor Insulation

ELECTRIC motor and generator insulation has come in for its share of announcements of "new" and "revolutionary" developments. But in spite of these announcements, inherent shortcomings of conventional insulation have remained.

There has been little basic improvement in motor insulating systems . . . UNTIL NOW.

Allis-Chalmers, working with engineers and scientists of Dow Corning Corporation, has developed *Silco-Flex* motor insulation . . . truly new in concept . . . truly new in effectiveness.

The *Silco-Flex* insulation system employs a pure silicone rubber combined with specially developed application techniques to produce an insulation unmatched by any other in use today. Outstanding improvements are shown in all these important characteristics:

Homogeneity — The complete *Silco-Flex* coil insulation is vulcanized into a single piece with no joints, voids or splices which can develop into breaks in the insulation. Even the best of the new conventional insulations combine several dissimilar materials which are held together by binders.

Heat Resistance — The excellent dielectric and mechanical properties in silicone rubber do not change significantly with aging at high temperatures over long periods of time.

Moisture Resistance — Completely sealed, *Silco-Flex* insulated coils are the most moisture-resistant coils ever produced.

Chemical Inertness — *Silco-Flex* insulation has outstanding resistance to most atmospheric contaminants, corona and weathering. It also withstands weak acids, alkalies and lubricants.

Flexibility and Resilience — *Silco-Flex* insulation remains flexible and resilient indefinitely under operating conditions. It is especially resistant to mechanical abuse and to the stresses brought about by overloading and rapid starting and stopping. It is also amazingly resistant to abrasion.

Heat Dissipation — Most electric insulators, unfortunately, are also heat insulators. *Silco-Flex* insulation, by comparison, is an excellent heat conductor and materially assists in removing heat from the coils.

What Are the Benefits?

The characteristics of this new insulation are so remarkable that complete reappraisal of motor application practices and motor performance is indicated.

In *all* applications, the chemical, mechanical and electrical properties of *Silco-Flex* insulation insure increased service reliability and longer life.

In addition, this new insulation system may reduce or eliminate the need for special motor enclosures. Atmospheres contaminated with cinders and fly ash, for instance, will have little effect on *Silco-Flex* insulated windings. Similarly, abrasive dusts in steel mills will not harm this insulation. Savings through the use of open, instead of totally-enclosed, frames will also be possible in chemical, paper, food and other industries where water or corrosive atmospheres are a problem.

What About Availability?

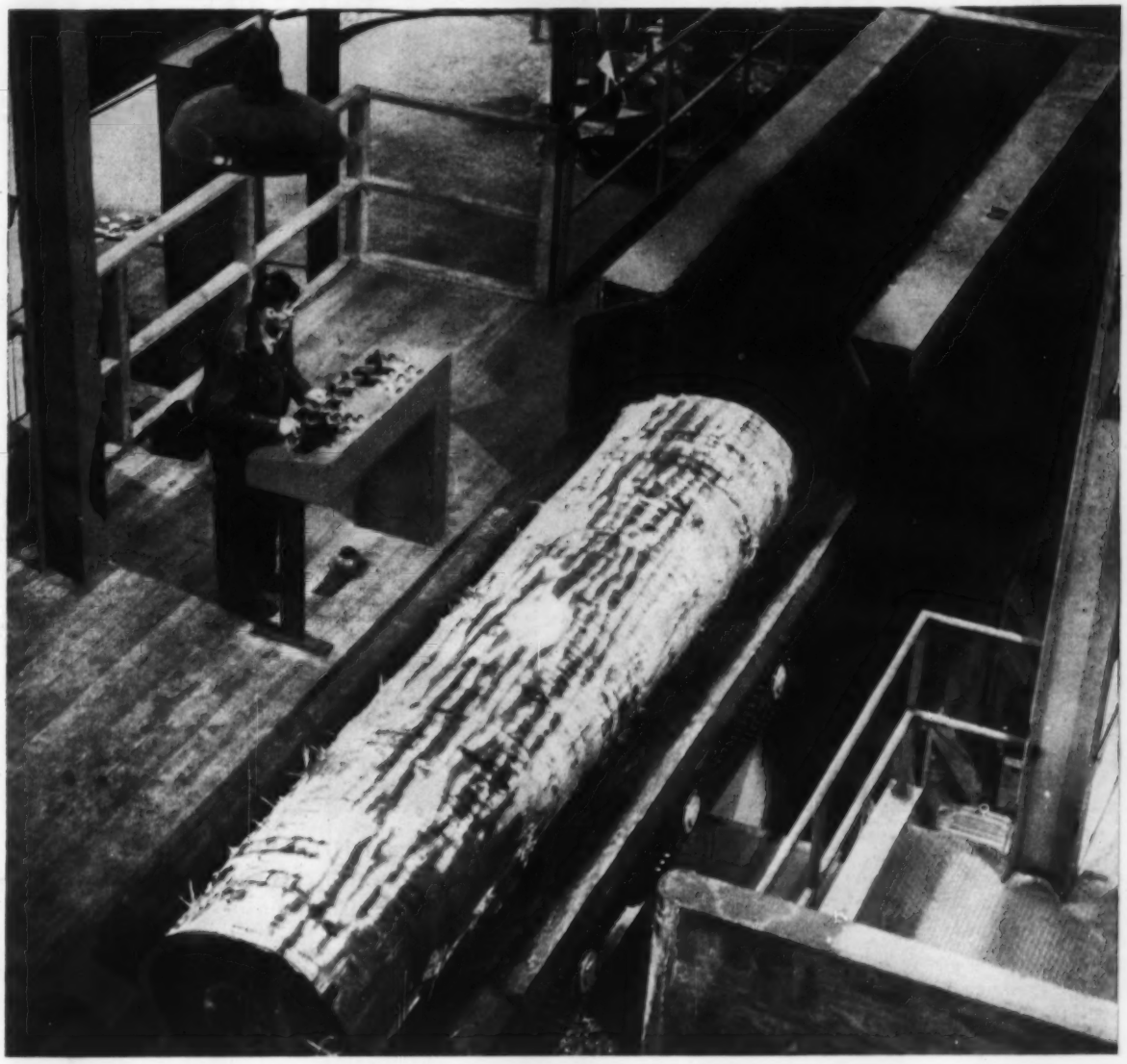
New *Silco-Flex* insulation is immediately available for all Class H form-wound coils and for Class A and B windings. operating under selected service conditions.

For complete information on SILCO-FLEX ***insulated motors, see your Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.*** A-4664

Silco-Flex is an Allis-Chalmers trademark.

ALLIS-CHALMERS

Mayari R makes it lighter... stronger... longer lasting



Making Chips Out of Tall Timber

Down from a Northwest tree farm the tall timber comes, to the pulp mill of Rayonier Inc., at Port Angeles, Wash. Then, barked and soaking wet, each 20-ft log is mechanically tipped into this steel chute which holds it upright while the chippers cut it up for the pulp digesters.

Measuring 9 ft around and weighing several tons, these thumping big logs pound the chute unmercifully. But Rayonier engineers foresaw this ordeal, and designed the chute with husky plates of Mayari R high-strength, low-alloy steel. Mayari R's high yield point and resistance to corrosion, impact and abrasion arm the chute for a long life in this grueling service.

Leckenby Structural Steel Company, of Seattle, fabricated the chute for Rayonier. Like many other fabricators, they found Mayari R as weldable and workable as other steels, without sharp changes from usual procedures. Our Catalog 353 gives the Mayari R story in full, including numerous case histories and application photographs. You can get a copy promptly through the Bethlehem sales office nearest you.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Ten Million TOCCO-Hardened Axle Shafts

Battery of TOCCO machines for hardening automotive axle shafts. TOCCO*-hardened shafts show an increase of up to 200% in resistance to torsional fatigue over furnace-hardened shafts made of alloy steel.

Give Super Service to American Motorists

The application of TOCCO* Induction Heating to the surface hardening of rear axle drive shafts for passenger cars and trucks provides a fine example of how a less expensive manufacturing method often results in the best possible end product.

For instance, TOCCO* Induction Hardening permits the substitution of easier machining carbon steels for expensive alloys, saving from 25¢ to 55¢ per car in material costs alone. Additional savings result from the fact that TOCCO eliminates the need for annealing, tempering and shot peening operations formerly required. Moreover, long hauls to and from the heat-treating department are eliminated because cool, clean TOCCO* fits right in the production line—next to related operations.

If you make parts that require hardening, annealing, brazing, or heating for forging or forming, it can pay you handsome dividends to investigate TOCCO* Induction Heating as a sound method of improving product quality *while reducing costs.*

THE OHIO CRANKSHAFT COMPANY

TOCCO

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-6, Cleveland 1, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating."

Name_____
Position_____
Company_____
Address_____
City_____ Zone____ State____

BAKER "FG"
— a new concept in gas truck construction —
"BALANCED DESIGN"

Here's how the Baker FG gas fork truck—"first in its class"—was conceived:

First: Exact requirements for a specific truck in the FG line were thoroughly analyzed. Then our engineers, working with a top manufacturer of heavy-duty industrial gas engines, chose the power plant specifically to meet these requirements. Even internal parts of the engine were balanced. For example, our specifications call for pistons balanced to ± 2 grams instead of the conventional ± 2 ounces.

Next: Transmission was selected to match the power plant and geared to provide required speeds and acceleration. In conjunction with the largest builder of axles in the country, the drive axle was developed to match power plant and transmission.

Lifting mechanism was selected to meet requirements and to be coordinated with power train and other components. *Mast* was engineered for the maximum safe lift, within the stability ratio of the frame which was designed for exceptionally low center of gravity. The standard Baker wide-angle steer, rubber mounted, trailing axle was modified to match the other elements.

Result: 100% Balanced Design
—another Baker "First".

Baker "FG" gas fork trucks are available with 3,000, 4,000, 5,000 and 6,000 pound capacities. Specific bulletins can be obtained by writing The Baker-Raulang Company, 1259 West 80th Street, Cleveland 2, Ohio.

Baker
HANDLING EQUIPMENT

8 REASONS WHY THE BAKER FG FORK TRUCK IS FIRST IN ITS CLASS...

1. LOWER INITIAL COST
FG-40 (4000 lb.) $3915. Other models at proportionate savings.

2. LONGER WARRANTY PERIOD
Baker quality permits full 6 months' warranty.

3. HIGHER LIFT
Mast design allows higher standard lift than ordinary trucks.

4. LOWER MAINTENANCE COSTS
Designed for easier and less frequent servicing.

5. MORE MANEUVERABLE
Short turning radius cuts aisle width, adds floor space.

6. EASIER TO OPERATE
Greater visibility . . . easy-to-work controls.

7. GREATER STABILITY
Lower center of gravity . . . higher "stability factor" ratio.

8. BETTER BRAKING
Full floating, self-equalizing, self-energizing brakes.

5G1

Here's the Complete "Package"

for Counting Electrically...

Added Evidence that —

Everyone Can Count on VEEDER-ROOT

This Veeder-Root Reset Magnetic Counter (AC or DC) is actuated through electromagnets. And it may be connected in series with any device having a contact arrangement . . . like the specially designed Veeder-Root Electrical Contactor at the left, which insures positive operation of the counter, either in oscillation or connected directly to a revolving shaft . . . with the counter placed at *any* distance from the machine or process on which the count is required.

This is another one of the hundreds of Veeder-Root Standard and Special Counting and Computing Devices developed for every conceivable counting duty, in every field from atomics to electronics.

What do *you* need to count? Just write:

VEEDER-ROOT INCORPORATED
HARTFORD 2, CONNECTICUT

Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C.
Montreal 2, Canada • Dundee, Scotland
Offices and Agents in Principal Cities
"The Name that Counts"

STEEL
The Metalworking Weekly

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MEMO TO: P.A.
re: Call Seymour for top quality BRASS C.E.

More and more buyers, designers and production men are learning that Seymour's new, up-to-the-minute production machinery and three quarter century of experience assures them of top quality Brass with . . .

● UNIFORMITY OF GAUGE for the full width and length of the metal.

● MAINTENANCE OF CLOSER TOLERANCES which is made possible by the use of modern, precision rolling equipment.

These pace-setting standards are rapidly raising Seymour-quality Brass to the top of the "Preferred" List for hundreds of executives who specify and buy primary metals.

Equally famous for their exceptional quality are Seymour NICKEL SILVER • PHOSPHOR BRONZE • WELDING ROD • BRIGHT (Plating) NICKEL • NICKEL ANODES

SEYMOUR
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MARKED IMPROVEMENT
In PLASTIC CONTAINER MARKING

For 40-odd years now, Markem has been helping to solve marking predicaments like this—first by studying the individual needs, then recommending the right machine, type and ink for the job. We call this business of showing people how to economically mark their products, parts and packages, the "Markem Method." Right now it's working well for some 5,000 companies, from one end of industry to the other. Most likely it can help you, too—either by "solving" your marking problem, or making a worthwhile improvement or two in your present method. Write us today—Markem Machine Co., Keene 30, New Hampshire.

Markem ...TO MAKE YOUR MARK

behind the scenes

Sweet Clarity

Last week we called attention to the efforts being made by STEEL editors in the matter of journalistic self-improvement.

You know, this business of reporting items and events of interest to the metalworking industry is not so simple as dashing off belles lettres for the delight of philologists. In good business publications consideration of the reader's time is a squeegee that removes excess wordage.

Everything that appears in STEEL has been selected, pared, squeezed, pruned and trimmed. Headings are concise; captions have meaning; news is analyzed in a nutshell; and features are designed to be interesting and useful. Then, all is right with the weekly edition. The self-improvement sessions continue, and Copy Editor Harry Chandler reports that his job grows lighter.

All of which brings us to "The turboencabulator in industry," an article written by J. H. Quick, B. Sc., graduate member of the Institution of Electrical Engineers, London, England—a country on an island lying in the Atlantic ocean, between France and Ireland.

We were privileged to see Mr. Quick's article in "Alumination," a monthly publication of T. E. Conklin Brass & Copper Co. Inc., 54-60 Lafayette St., New York 13, N. Y.

When Mr. Quick considered the turboencabulator and wrote his findings, he didn't handicap himself by submitting to the discipline imposed by the considerations of time and space; he simply latched on to a 20-lb dictionary, and let himself go.

"The original machine," said Mr. Quick slowly, "had a base plate of prefabulated amulite, surmounted by a malleable logarithmic casing in such a way that the two spurving bearings were in a direct line with the pentametric fan. The latter consisted simply of six hydrocoptic marzelvanes, so fitted to the ambifascient lunar waneshaft that side fumbling was effectively prevented. The main winding was of the normal lotus-o-delta type placed in panendermic semiboloid slots in the stator, every seventh conductor being connected by a nonreversible tremie pipe to the differential girdlespring on the 'up' end of the grammeters."

After pursuing the formidable Mr. Quick through a maze of supramitive wennel-sprockets and regugritative purwells, we decided that his great familiarity with anhydrous nangling pins and bitumogenous spandrels was traceable to the fact that in his formative years he was known to have consorted with parallelograms, obtuse rhomboids and known dactylographs.

A Friend Indeed

Coming up for air, we feel that it is our duty to remind you that June, aside from being the month of roses and brides, also is the American Fresh Water Pearl Month.

The American National Patriotic Society, 130 W. Jefferson St., Pittsfield, Ill., champions the fresh water pearl and calls our attention to the great beauty and value of these native gems. Years ago Iowa button factories used to employ steam dredges to maintain supplies of fresh water mussels, and we assume pearls were merely by-products. The gems came from afflicted mussels, anyway, and nobody seemed to care that some day they'd all be dead.

It's a relief to know that the fresh water mussels now have a friend, and if you happen to have any old fresh water pearls around, ol' Shrdlu will be happy to accept them for admiration purposes.

Pizza Percentage

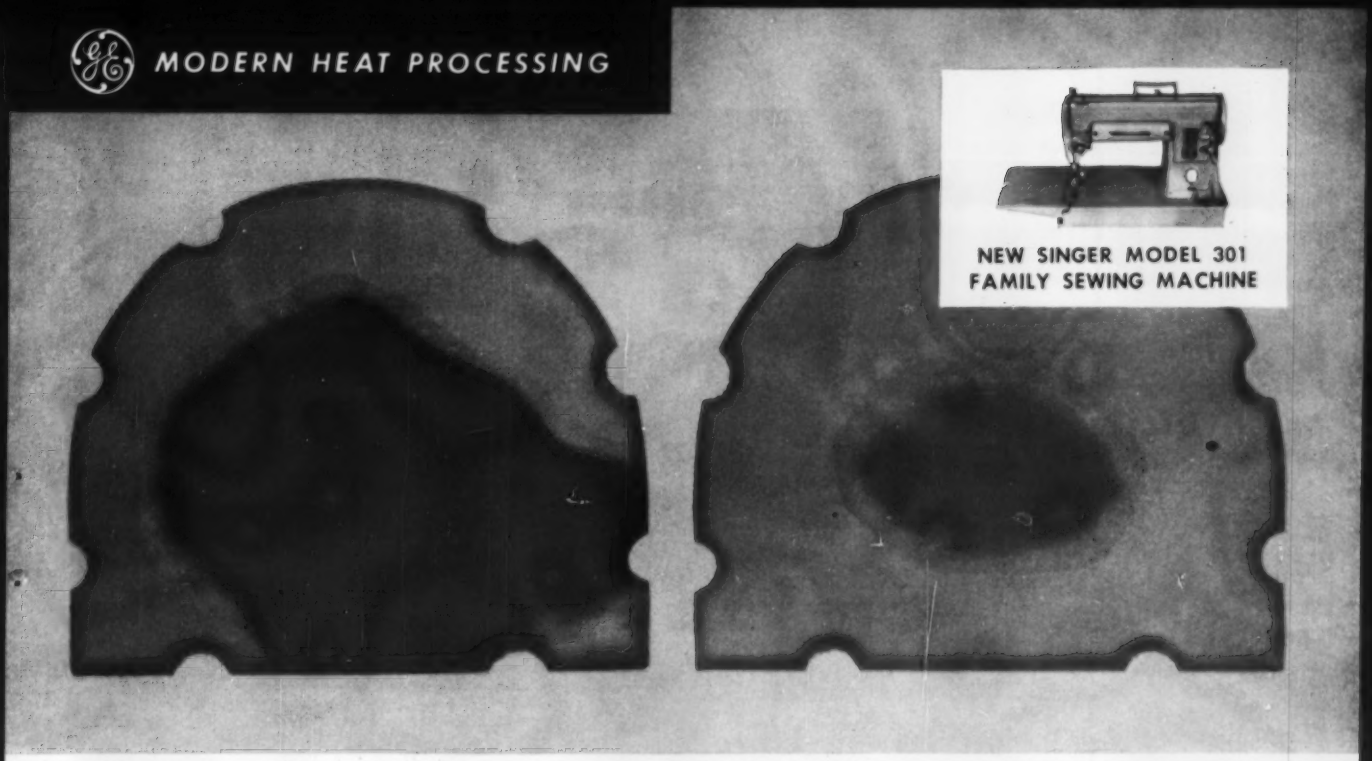
The problem about the digits was nasty, and we are not surprised that it was greeted by a vast silence. There was not a single return! The answer was: None. To make up for it, here is an easy one:

Virgil Sylvester quit buying pizza pies until he had $100 saved. Slinking into a bank, he deposited the money and then went on a pizza binge that lasted 4½-years. At the end of that time, interest had been added eight times, and Virgil's passbook showed a total of $131.68. What was the rate of interest within ½ of 1 per cent?

Shrdlu

(Metalworking Outlook—Page 41)

MODERN HEAT PROCESSING



NEW SINGER MODEL 301 FAMILY SEWING MACHINE

OLD METHOD hardened too much of part area, causing warpage. **G-E INDUCTION HEATER** cuts heat-treated area 75% —warpage reduced.

PROBLEM:

Old method of hardening SINGER Sewing Machine parts caused warpage, doubled costs

SOLUTION:

G-E Induction Heater "Pinpoints" Heat Reduces Costly Warping of Treated Parts

The Singer Manufacturing Company, Elizabethport, N. J. was having trouble hardening parts for its sewing machines. Only a small area in the high-carbon steel item needed hardening. But too large an area was being heated with the fuel-fired method used. This resulted in warpage. And subsequent straightening of the part was required. Result—high labor costs and production slowdowns.

A G-E 5-KW INDUCTION HEATER was selected because of its greater selectivity in heating the required area. Now the affected area is "zeroed in" with induction heat. The heated area is reduced 75%, thus greatly reducing the costly warpage. As a result, at least twice as many of these parts per day are being produced with the new 5-kw induction heater for the new SINGER 301 family Sewing Machine.

THE OVER-ALL IMPROVEMENT was explained by the manager of the heat-treating department of The Singer Manufacturing Company: "This method of heating has reduced the area affected by high temperatures to one-quarter of that obtained by the former method. With the G-E induction heater, the warpage is greatly reduced and straightening is no longer a problem. This improvement has produced more uniformly graduated marking on the finished parts and helped us to cut cost."

GENERAL ELECTRIC

G-E 5-KW INDUCTION HEATER

with built-in variable output transformer, handles jobs formerly requiring larger heaters.

For application assistance, contact your nearest G-E Apparatus Sales Office or send coupon for free bulletin GEC-920B.

General Electric Company
Apparatus Sales Division, Section D722-1
Schenectady 5, New York

Name .....

Position .....

Company .....

City ..... **State** .....

navigation...

This newest ARMA StARMArine Gyro-Compass—1/50 the size and 1/20 the weight of its predecessors—has achieved near-total elimination of friction—for precision navigation. Ball bearings used in its control parts must be as friction-free as modern science can produce... Federal Ball Bearings, of course!

so much of industry *turns* on FEDERAL ball bearings

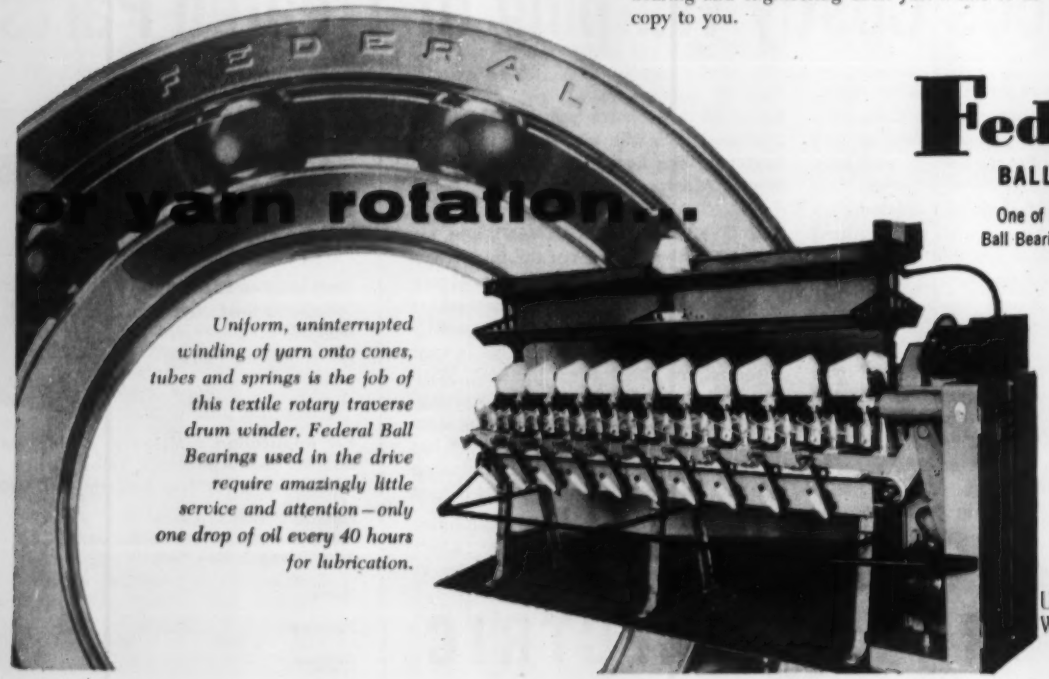
Guiding man by sea, air or land! Or yarn from bobbin to cone! On sunny farms or in busy machine shops, you'll find Federal Ball Bearings. Because, wherever anti-friction work is to be done, Federals are on the job! Hundreds of makes—12,000 sizes—all produced by a 50-year-old maker of ball bearings *exclusively.*

When Federal Ball Bearings are part of so many things you *use*, shouldn't they be part of the things you *make?*

THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, N. Y.

Get FEDERAL'S NEW CATALOG! With 175 pages of ball bearing and engineering data. Just a line to us will speed your copy to you.

or yarn rotation...



Uniform, uninterrupted winding of yarn onto cones, tubes and springs is the job of this textile rotary traverse drum winder. Federal Ball Bearings used in the drive require amazingly little service and attention—only one drop of oil every 40 hours for lubrication.

Universal Winding

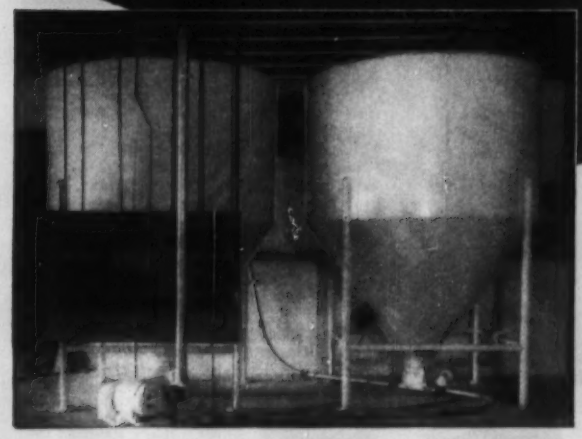
Federal

BALL BEARINGS

One of America's Largest Ball Bearing Manufacturers

NO down time

in 16 years



● Flour Storage Bins—each 1000 lbs. capacity

Photos courtesy Century Machine Company, 4344 Marburg Avenue, Cincinnati 9, Ohio

The records of the Century Machine Company show "no down time in sixteen years use" on this Cincinnati Press Brake.

This machine, working a 9½ hour day, forms light gauge sheets in mild and stainless steel up to ¼" thickness. It is constantly producing accurate parts for easy assembly of Century's baking ovens and bakery machinery.

Write for new Press Brake Catalog B-4 describing Cincinnati Interlocking All-Steel construction, Centerline Loading, deep rigid beds and rams.

THE CINCINNATI SHAPER CO.

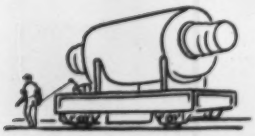
CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

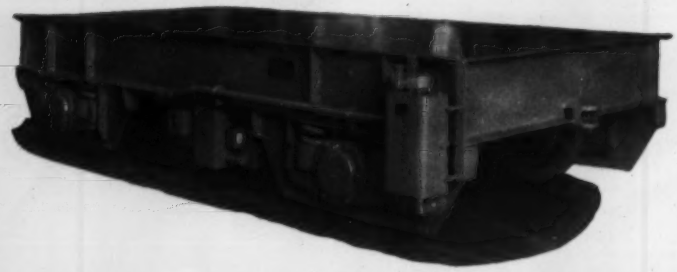
TRANSFER IT SAFELY

at Less Cost with

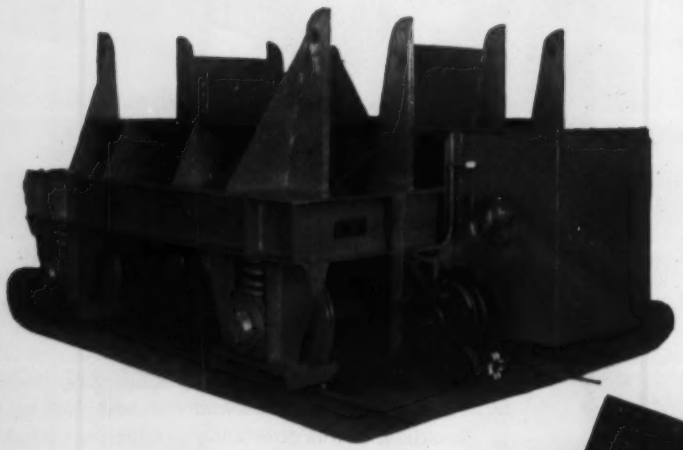
ATLAS



Atlas Safety-Type Transfer Cars are outstanding for moving heavy materials over short distances. Designed for storage battery, diesel or gas-electric, or cable reel service. Only one simplified control lever for safety. The car moves only when the operator holds the lever.



50-TON STORAGE BATTERY FLAT CAR



64-TON ELECTRIC FLAT CAR

Request "Walk-Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

LETTERS
TO THE EDITORS

Steam Heat Treating

May I have three copies of article No. 14 in your Modern Heat Treating series? It's called "Steam Heat Treating Boosts Processing Efficiency" (May 9, page 82). I also feel we should let you know we find "STEEL, The Metalworking Weekly," a timely and useful magazine. It is read by all of our fabrication department's supervision.

Fred Grossher
Superintendent
Fabrication Department
Consolidated Vultee Aircraft Corp.
San Diego

Pat on the Back

In your outstanding article, "Business Communication: Put It on Executive-Saving Time" (May 16, page 103), mention was made of a manual developed by Standard Oil of New Jersey for a course in conference leadership. Is this manual available to others, and if so, to whom should we write?

You deserve a pat on the back for your 1955 Program for Management series. So far, it even surpasses the 1954 and 1953 series, and they were excellent. We are clipping the articles as they appear.

Robert A. Evans
Chief Engineer
Pittsburgh Steel Foundry Corp.
Glassport, Pa.

• *We suggest you inquire at the Esso Training Center, Standard Oil Co. of New Jersey, 30 Rockefeller Plaza, New York, N. Y. If not available there, the American Management Association, 330 W. 42nd St., New York 36, N. Y. has reprinted a 30-page pamphlet from the manual. Reprints of this are available from AMA.*

Conferences in particular and communication in general are of immediate concern to our management. This article should be a help to us.

A. Sarka
Assistant Production Manager
Moore Products Co.
Philadelphia

. . . Your story impresses me so much that I would like to make it an integral part of our Foreman's Manual. May I have 25 copies?

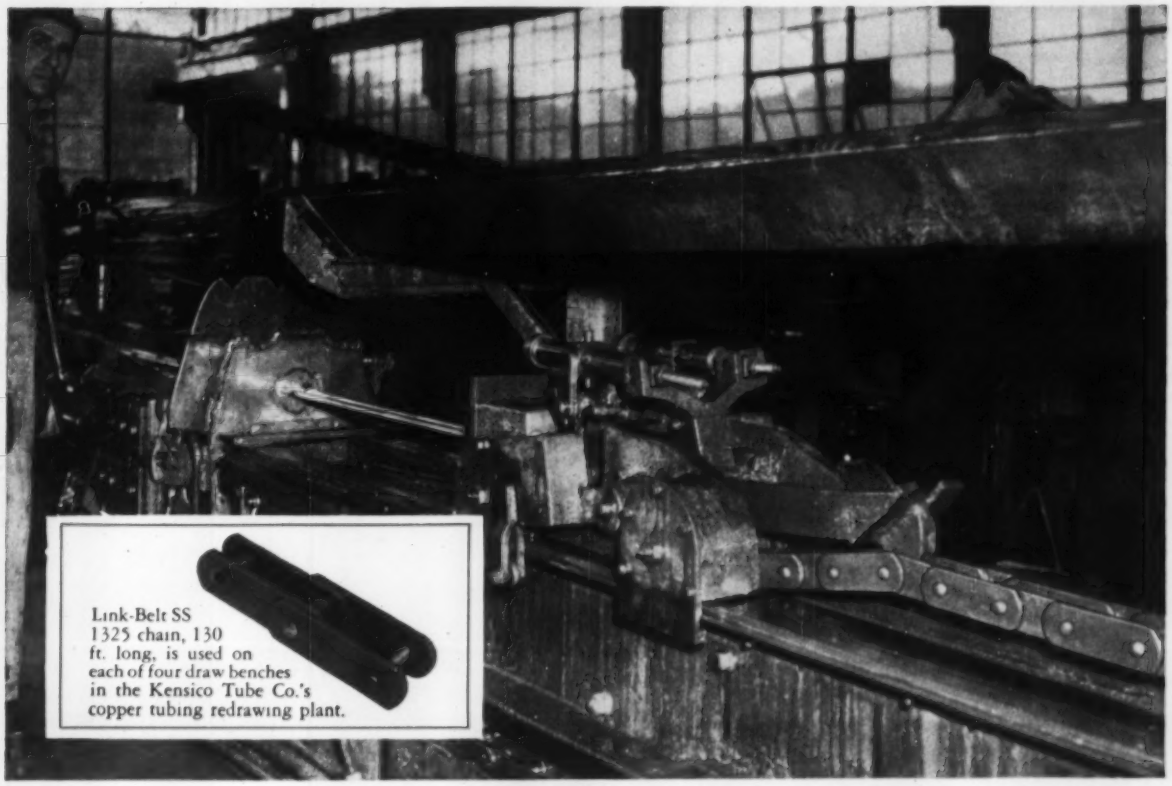
D. M. Cowley
Superintendent
The Mackenzie Walton Co.
Pawtucket, R. I.

Leaded Steel Welds

Did research for your excellent articles on leaded steels in the Oct. 25, 1954, issue of STEEL, turn up any suggestions

(Please turn to page 12)

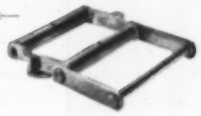
Here's why so many of the nation's draw benches use LINK-BELT chain



Link-Belt SS 1325 chain, 130 ft. long, is used on each of four draw benches in the Kensico Tube Co.'s copper tubing redrawing plant.

No ONE chain serves every purpose —get the RIGHT one from the complete line

Class H drag chain—for drag conveyors, handling shavings or other refuse in runways or troughs.



Class C combination chain—popular, durable, low cost design for elevators, conveyors.

LXS chain — particularly suitable for heavy-duty drive and conveying jobs.

Transfer chain with tilting dogs — for plate and slab travel, loads up to 500,000 pounds.

LINK-BELT offers the chain that's best for every job

WHETHER it's for a 5000 or a 100,000-pound bench, Link-Belt draw bench chain is built to maintain close pitch and correct sprocket contact. Links are accurately machined after hardening by a special process that assures longer chain life.

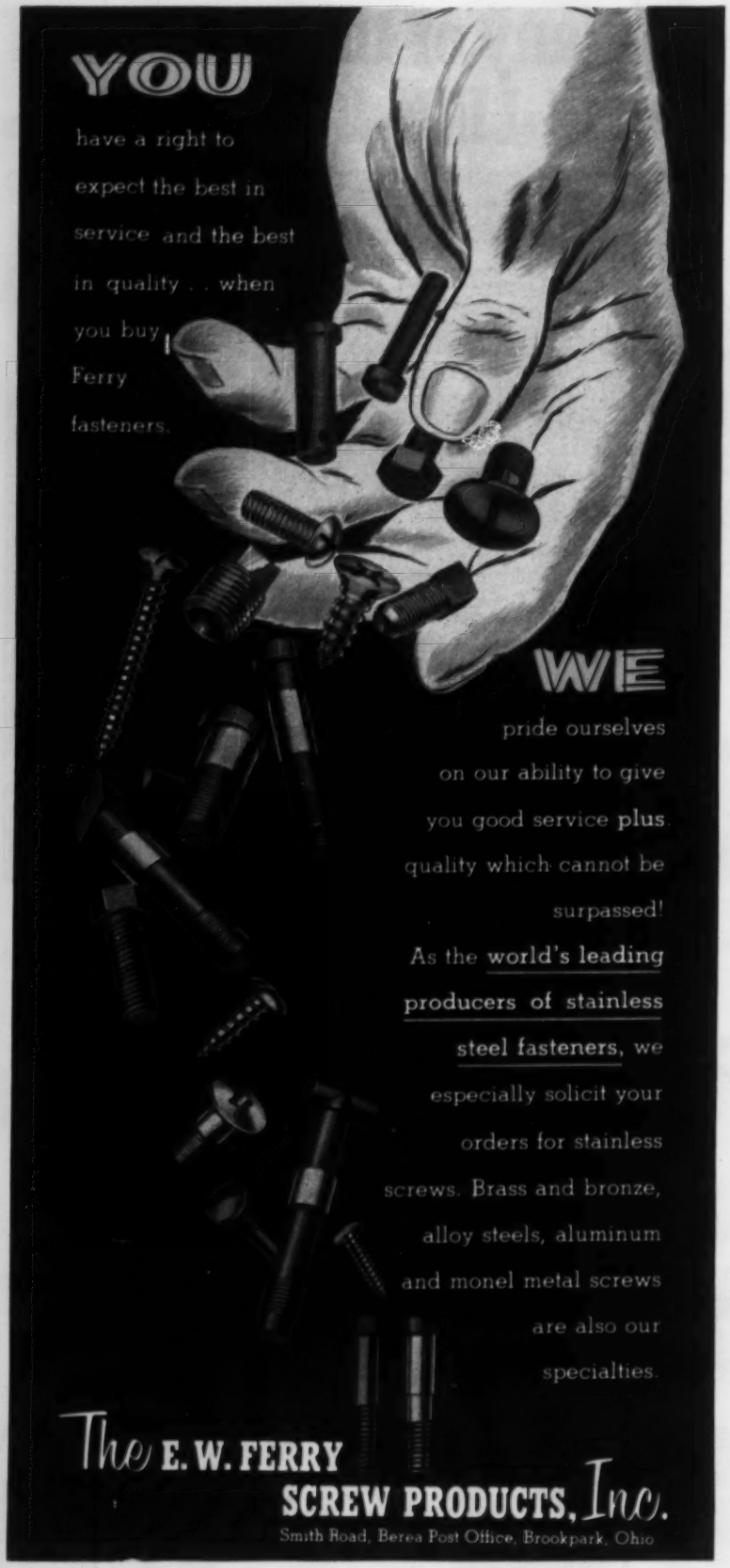
Manufacturing refinements such as these are typical of every chain in the complete Link-Belt line. Accurate control of raw materials and manufacturing processes is your assurance of uniformity.

For complete information on chains and sprockets for draw bench or any drive or conveyor service, see your Link-Belt sales representative. He can show you the *one* chain that's best for your requirements.

LINK-BELT

CHAINS and SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Sydney; South Africa, Springs. Representatives Throughout the World. 13.350



LETTERS

(Concluded from page 10)

for welding them? Preliminary experiments here have not produced satisfactory welds. Any help you can offer would be appreciated.

Edward W. Randall
Morgan Construction Co.
Worcester 5, Mass.

• *Allis-Chalmers Mfg. Co. tells us it welds leaded steels fairly regularly although it cautions not to use them where high-strength pressure welds are necessary. Welding has been done mostly on fastening divider plates in shells for large condensers.*

Allis-Chalmers says: "We did find leaded steel difficult to weld where there is a poor fitup. Most of the welding is done in a down-hand position although we are able to weld the leaded steel in any position where necessary. We use any good 6012 rod."

Up in the Air

Our firm recently started fabricating aircraft components manufactured from the high tensile steels that are commercially available under various military specifications. We do not have a library on these aircraft and related steels and would appreciate a copy of the "Supply and Logistics Handbook" published by STEEL.

Leo R. Dorbeck
Project Engineer
Bawden Industries Ltd.
Toronto 3, Canada

Well-Timed Subject

The technical article, "More Muscles in Steel" (Apr. 25, page 96) is an excellent piece of work and is well-timed.

M. J. Weldon
Metallurgist
The Henry G. Thompson and Son Co.
New Haven 5, Conn.

Plastic-Coated Fences

We are interested in a plastic coating in color for applying either by dipping or spraying on galvanized steel pipe and wire fence. The material must stand rain, wind and, especially, the sun. We would appreciate your advice on whom to contact.

Charles B. Smith
Panelink Fence Co.
Phoenix, Ariz.

• *There are a number of companies that make colored plastic coatings. A colored plastisol coating for deep freeze trays and racks recently was announced by United Chromium Inc., 100 E. 42nd St., New York 17, N. Y. We suggest you write to this firm, addressing your letter to J. A. Williams.*

How Eastman Kodak gets Extreme accuracy...fine finish... years of trouble-free grinding

Norton wheel spindle a key factor in grinding performance that means...

steady savings!

Installed In March 1936 at Eastman's Kodak Park Works in Rochester, N. Y., this Norton 10" x 96" Type C Cylindrical Grinder grinds alloy steel rolls to precision accuracy and very fine finish. Original wheel head spindle bearings have required no servicing in more than 18 years of 8 to 24 hours daily operation.

The Norton Wheel Spindle Unit is an outstanding aid to the speed, accuracy and long service life of Norton cylindrical grinders. Note its over-all ruggedness and big heavy bronze bearings covering over half the spindle body.

Why are Norton cylindrical grinders so fast and accurate over such a wide range of precision finishing and heavy stock removal jobs?

Why do these hard-working machines last so long, cost so little to maintain?

Advanced features like the Norton wheel spindle unit are the answer. Advantages of this typical Norton development for better, lower cost grinding include:

- *Over 50% of spindle body enclosed in two large heavy-duty, hard bronze bearings for extra long life.*
- *Rugged proportions, and metals toughened by special heat treating, are further aids to long service.*
- *Rigid support over practically the entire spindle surface affords maximum resistance to wheel pressures.*
- *Bearing length of more than twice the diameter increases bearing life.*
- *Automatic flood lubrication of bearings, with flow continually visible through bull's-eyes — an important safety and control feature.*
- *End thrust taken on two large, hardened steel surfaces, also flood lubricated.*
- *Modern precision boring for exact oil clearance keeps lubrication at top efficiency.*
- *Wheel speed changes possible without readjusting bearings.*
- *Extremely low unit pressure, due to long, continuous bearing surfaces, permits fast cutting and enduring accuracy.*

For further facts on how Norton cylindrical grinders can benefit your production, see your Norton Representative. Or write direct for Catalogs. And remember: only Norton offers you such long experience in both grinding wheels and machines to help you produce more at lower cost. NORTON COMPANY, Machine Division, Worcester 6, Mass. *In Canada:* J. H. Ryder Machinery Co., Ltd., Toronto 5.

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This Steel keeps these outdoor phone

Republic Electro Paintlok

Year-round weather is mighty rough on outdoor phone booths. To make them practical from a maintenance standpoint, as well as continually attractive, a durable, long-lasting finish is a must.

That's why the Sherron Metallic Corporation of Brooklyn, New York, chose Republic Electro Paintlok for its popular all-metal outdoor booths.

Electro Paintlok is the zinc-plated steel sheet that is chemically treated to take paints, lacquers, synthetic enamels—and hold them in a tight grip for years, even under hard service and severe exposure.

Furthermore, only minimum maintenance is required. Should the painted surface become scratched, the tight zinc coating protects against underfilm corrosion and

REPUBLIC

World's Widest Range of Standard

REPUBLIC STEEL

REPUBLIC STEEL CORPORATION
3120 East 45th Street • Cleveland 27, Ohio

Please send more information on:

- ☐ Republic Electro Paintlok
- ☐ Republic Stainless Steel
- ☐ Republic Mechanical Tubing
- ☐ Republic Cold Finished Steel Bars and Shafting

Name _____ Title _____

Company _____

Address _____

City _____ Zone ____ State _____

K-8606

booths color-bright

provides lasting paint adherence

creeping rust that would eventually cause trouble.

Republic Electro Paintlok is easy to fabricate, too. The well-bonded zinc coating will not fracture during fabricating, will not crack, peel or flake when punched or sheared.

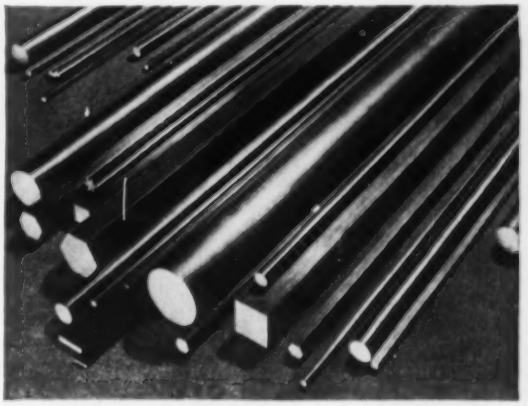
The entire finishing operation is speeded because Electro Paintlok requires no special cleaning. A water-soluble cleaner will quickly remove fingermarks and warehouse dirt. And since surfaces are pre-conditioned, no pre-etching is required.

If you want your painted or enameled steel products to look better longer, get the complete facts on Republic Electro Paintlok. Send coupon for Republic Book 525.

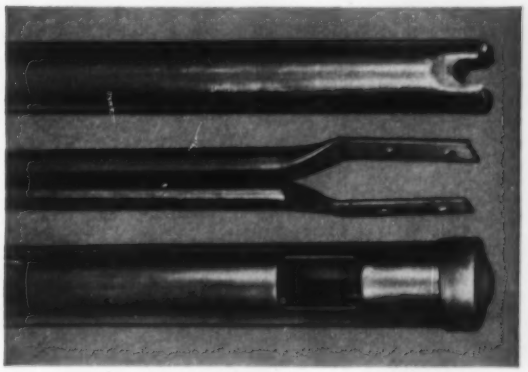
STEEL

Steels and Steel Products

ENDURO STAINLESS STEEL DOES MANY JOBS EFFICIENTLY AND ECONOMICALLY. Here ENDURO, produced at Republic's Alloy Division, is used in a bellows that goes between a jet engine and exhaust tubes because of its heat-resistance and ability to expand and contract uniformly. There are other advantages—such as increased structural strength without added weight. Corrosion-resistance. High physical and chemical properties. Republic metallurgists will help you use ENDURO to best advantage.



COLD FINISHED STEEL BARS AND SHAFTING by Republic have a bright, smooth surface that rarely requires further machining. In addition, they include all the other qualities you want in steel parts production—accuracy of section, high strength, close tolerance, and uniformly high *machinability* to help you produce more parts at lower unit cost. Republic's Union Drawn Division supplies cold finished rounds, squares, hexes and flats in all standard and special carbon, alloy and stainless steel analyses.



IF YOUR PRODUCT INCLUDES TUBULAR PARTS, you can save an investment in new equipment by letting Republic produce them. Its Steel and Tubes Division has complete facilities for handling all kinds of tough fabricating jobs—like bending, broaching, coiling, configuring, expanding, flattening, grooving, notching, upsetting, tapering—to name just a few. For precision on a production basis—that will lower your fabricating costs—call Republic. Send coupon.

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looks like a crayon...

marks like a crayon...

tells temperatures like a precision instrument!

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ALSO AVAILABLE IN LIQUID AND PELLET FORM . . . WRITE PROMOTION DEPT. FOR SAMPLE TEMPIL° PELLETS . . . STATE TEMPERATURES OF INTEREST—PLEASE!

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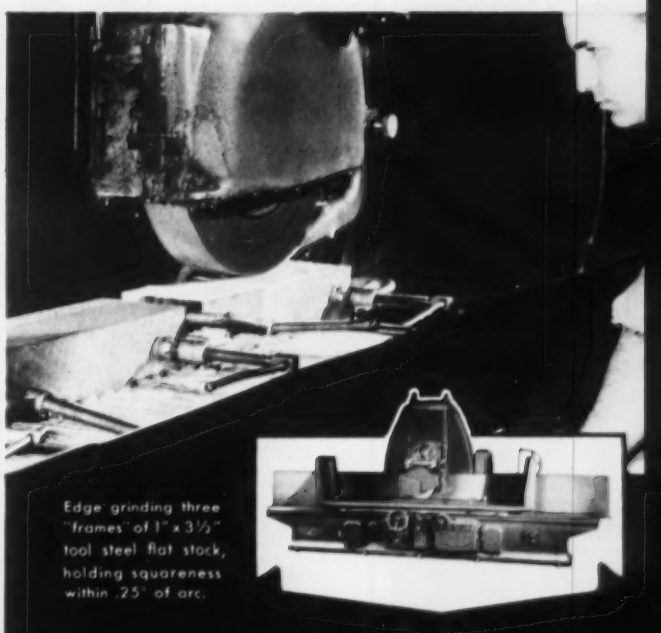
MATTISON GRINDERS

IF IT'S A FLAT SURFACE THERE'S A MATTISON TO GRIND IT!

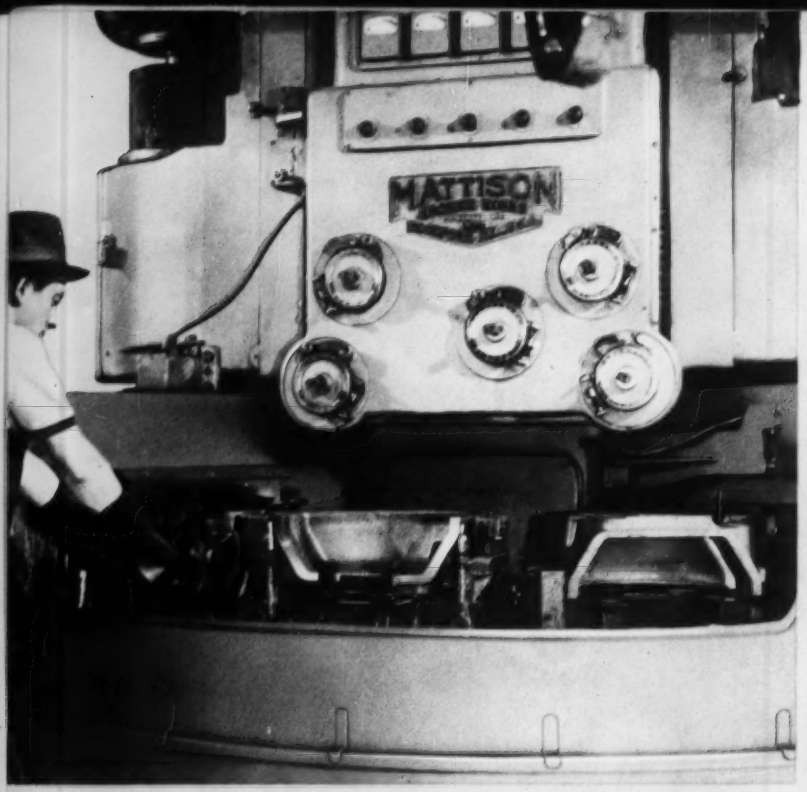
GRINDING METHODS

Big grinders profitable investment for small plants!

Starting production in 1945 with one Mattison High-Powered Precision Surface Grinder, Marshall Steel Co. rapidly has grown to be one of the nation's largest single producers of ground flat stock. Today, nine "Mattisons" are the determining factor in Marshall's ability to produce a complete range of standard ground flat stock sizes, exemplifying the profit-power of these versatile machines on jobs requiring: 1) accuracy well within the needs of toolroom work, 2) ability to produce fine finish, and 3) capacity to handle long or short runs and large or small parts with decisive efficiency and ease. If you have a variety of parts requiring flat or contour machining, you can save tool costs, speed production, eliminate roughing operations, and upgrade quality by grinding them on a Mattison High-Powered Precision Surface Grinder. Write for Bulletin "HP."



Edge grinding three "frames" of 1" x 3½" tool steel flat stock, holding squareness within .25" of arc.

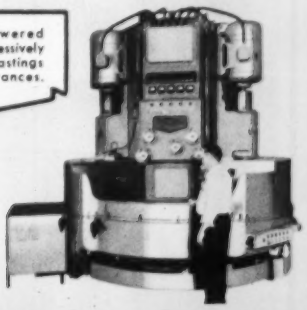


For work up to 16" high and stock removal to .150", the "No. 100" is a high-powered production grinder, with exceptional rigidity and wide work range. Continuous single-pass grinding produces more parts, more accurately, at lower unit cost.

Finishes three faces from rough ... 50 pieces per hour

Sets of three different fixtures on this No. 100 Rotary Automatic permit grinding pan face, engine face, and transmission face of flywheel housings at the rate of 50 finish pieces per hour (150 surfaces). With five grinding wheels powered by 40 hp motors, up to ⅛" stock is easily removed from the rough castings. Automatic compensation for wheel wear eliminates down-time . . . machine is stopped only when wheels are worn behind useful limits. On long run jobs, the Mattison Rotary Automatic is an advanced, high-production method for machining flat surfaces. Write for Bulletin No. 147-2.

Five high-powered spindles progressively finish rough castings to close tolerances.

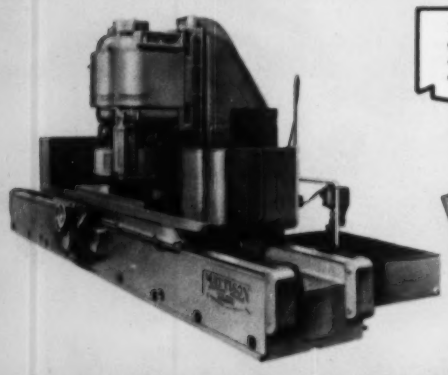


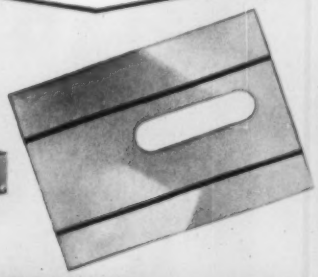
SELECT THE RIGHT GRINDER FOR YOUR JOB FROM MATTISON'S COMPLETE LINE OF OVER

"Cost 60 to 70% lower"... finishing large saw tables

By grinding these cast iron machine tables on the Mattison No. 400SS Vertical Spindle Surface Grinder, production costs are 60 to 70% lower than by other methods. This is because the "400SS" is adequately powered and rigidly constructed for high stock removal when machining large, uninterrupted surfaces. The wheel is constantly self-dressing and free cutting. There's no heat distortion to destroy finish and accuracy . . . no downtime for dressing a "loaded" grinding wheel. These factors, plus extra-wide work table and 25" wheel clearance, make the "400SS" a fast, low-cost method for machining large surfaces. Write for details—Bulletin 847.

28" wide saw tables are ground flat, and within .005" over entire 38" length, using 32" dia. wheel.

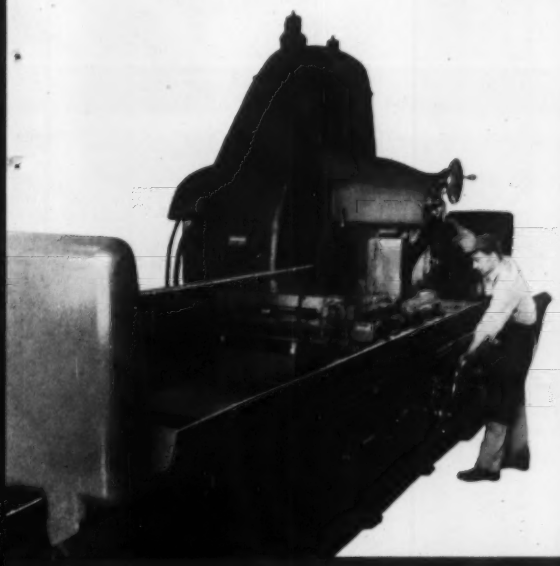




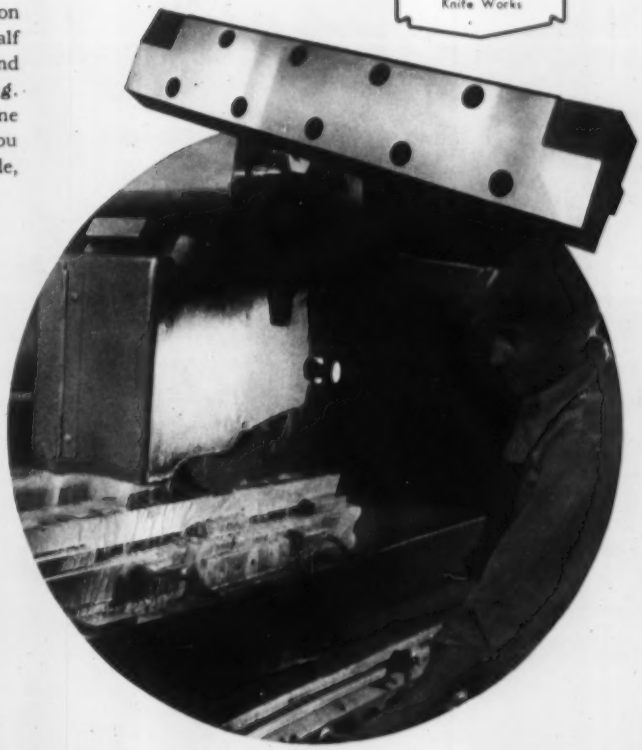
Production is 8 to 12 table tops per hour and 35 to 40 mount pads per hour. Stock removal is .060". Courtesy—Rockwell Manufacturing Co., Delta Power Tools Division.

Produces extra fine finish on hard tool steel... holds form within .001"

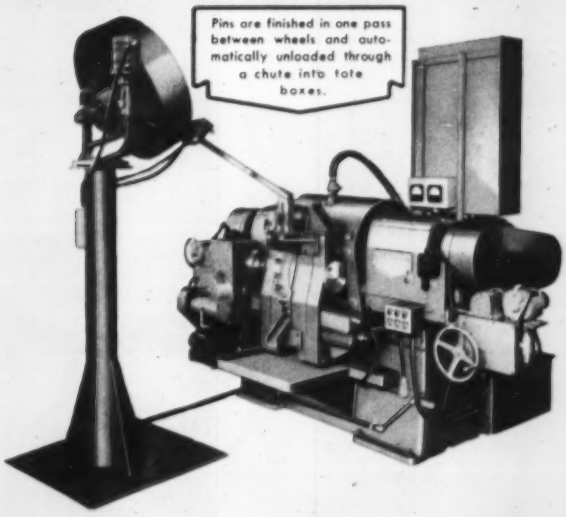
Tool steel toggle cam shoes are form ground on this Mattison High-Powered Precision Surface Grinder in less than half the time required on a tool grinder. Two shoes are ground per load, holding the radius to +.001", minus *nothing*. Finish, with an 80 grit wheel, is excellent. This is only one example of the variety of work other than flat grinding you can do at profit-boosting speed and precision on this versatile, high-powered grinder. Write for Bulletin "HP."



Courtesy—
Lancaster Machine
Knife Works



GO DIFFERENT MACHINES + SURFACE GRINDERS + FACE GRINDERS + DISC GRINDERS



Pins are finished in one pass between wheels and automatically unloaded through a chute into tote boxes.

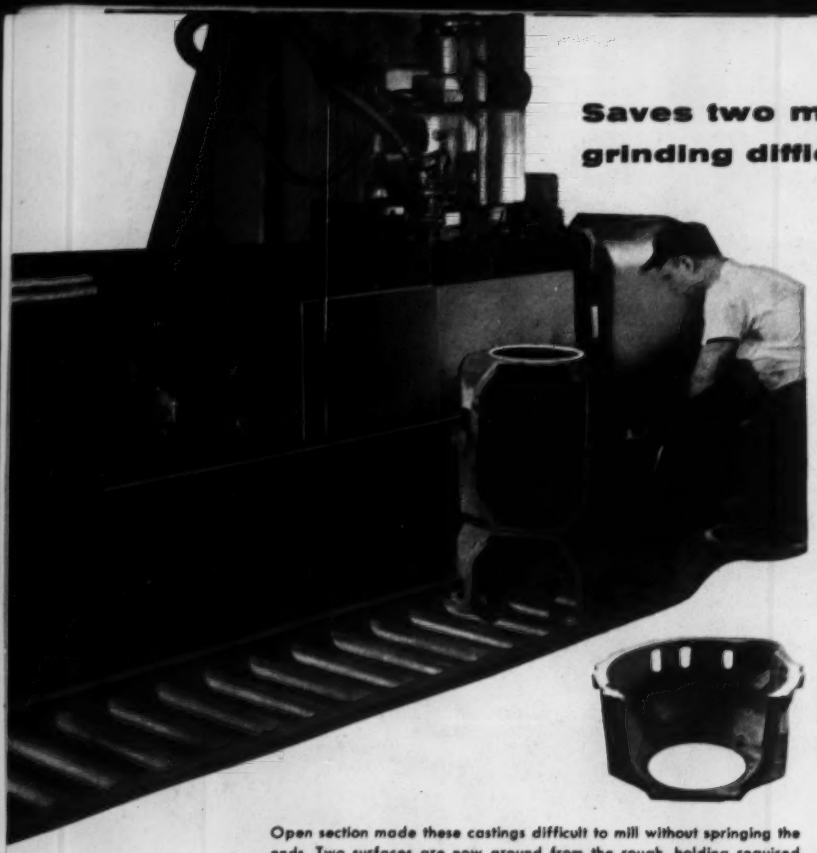
The No. 221 Production Disc Grinder, with 22"-24" wheel capacity, gives you faster, more accurate production of piston rings, coil springs, universal joint spiders, and similar parts. Write for Bulletin 647.

Grinds 2100 piston pins per hour... with automatic hopper feed!

Removing .010" stock from both ends of steel piston pins, this Mattison No. 221 Double Spindle Disc Grinder finishes 2100 pieces per hour, holding length and squareness within .001". Pins from the hopper enter a stacking mechanism, from which they are picked up automatically by a rotating carrier plate and clamped in hardened "V's" for grinding. Sizing devices continuously gauge accuracy of the work and actuate the feed to compensate for wheel wear. Thus, non-productive machine time is minimized and only spot-checking of pieceparts for size and squareness is necessary.

MATTISON
HIGH-POWER
GRINDING METHODS

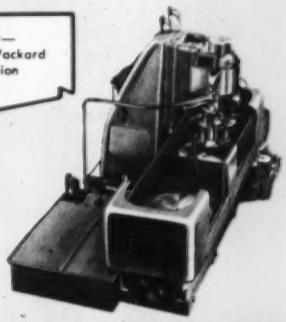
Saves two milling operations...finish grinding difficult-to-machine castings to close tolerance!



Torque converter housings were formerly milled (two cuts per surface) and then finish ground to the required tolerance. Today, top and bottom surfaces are ground in one operation per side on a Mattison "Duplex Rotary" at the rate of 17.4 pieces per hour . . . removing .060″ to .070″ stock from each surface . . . holding all surfaces flat and parallel within .0015″. *One* operator and *one* machine easily do the work of two! The Mattison "Duplex" is powered and rigidly built for heavy, multiple-pass grinding of small- or medium-size pieceparts. For simple facing operations, it will give you increased production and greater accuracy at lower cost!

Open section made these castings difficult to mill without springing the ends. Two surfaces are now ground from the rough, holding required accuracy with ease. Two rotary tables eliminate nonproductive time ordinarily required for cleaning the chuck and loading the work on a single-table machine. Write for Bulletin No. 145.

Courtesy—
Studebaker-Packard
Corporation



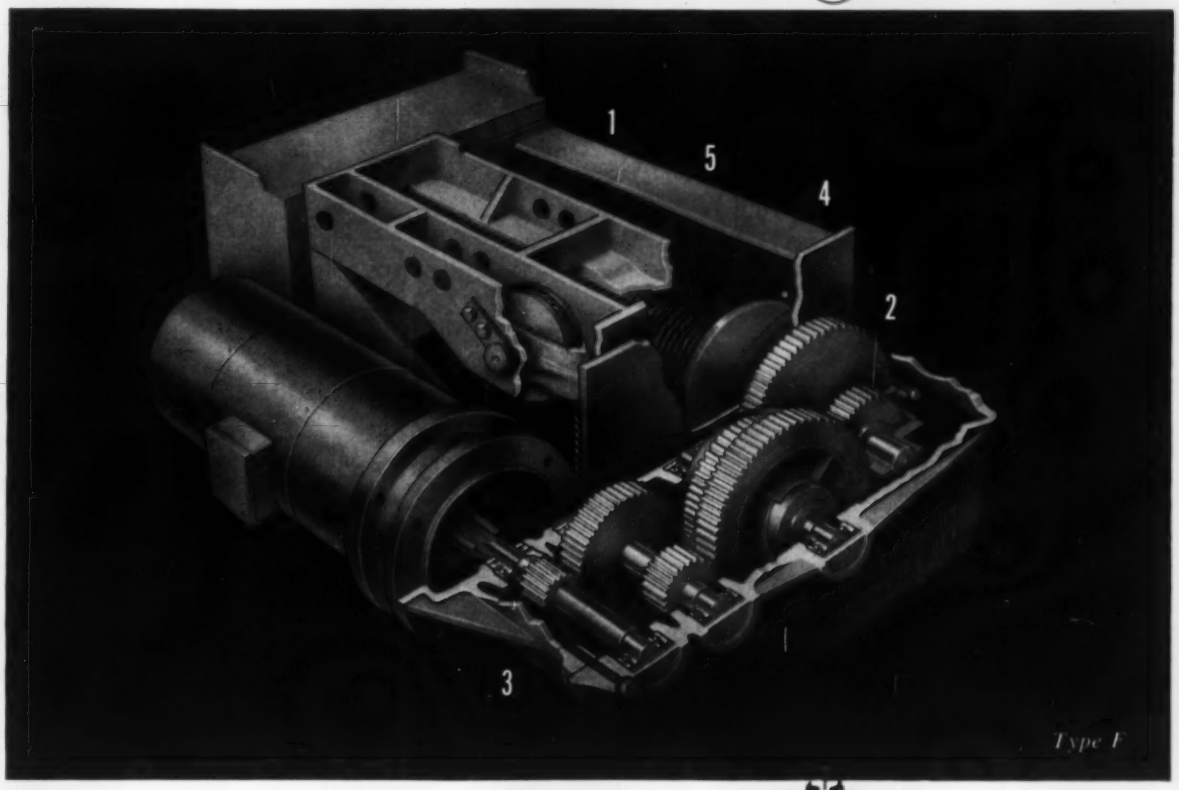
SEND PARTS TO MATTISON METHODS LABORATORY FOR SAMPLE GRIND AND PRODUCTION ESTIMATE

The Mattison Methods Laboratory . . . equipped with all major types of modern surface grinders, face grinders, and disc grinders . . . introduces a new service to metalworking plants. You are invited to submit parts for sample grinds, production estimates, wheel recommendations, and other production requirements. Please include part prints, operation or route sheets, and all special requirements for machining your pieceparts. You'll get a comprehensive report based on close duplication of field conditions. With over 50 different grinders for production and toolroom work, Mattison can specify machines that meet your needs *precisely* . . . and give you maximum accuracy, productivity, and economy.

MATTISON
MACHINE WORKS
ROCKFORD ILL. U.S.A.

HIGH-POWERED SURFACE GRINDERS

MATTISON MACHINE WORKS
ROCKFORD, ILLINOIS



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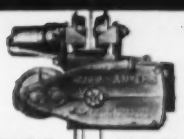


HOW "PATH OF STEEL" CONSTRUCTION SAVES YOU MONEY

Lift and move loads up to ten tons—and spend less on repairs, less on maintenance—with the lasting extra strength of Robbins & Myers' *all steel* "F" Hoists.

Check these points—from trolley to hook—

1. Electrically *welded steel frames,* solidly braced.
2. *Alloy steel* gears.
3. *Alloy steel* shafts, with ultimate tensile strength of 278,000 lbs. psi.
4. Drums of *heavy steel* pipe, with *steel* flanges, or, in larger models, of *solid* castings.
5. *Plow steel* wire rope, pre-formed, with 6 x 37 stranding, lubricated hemp center—extra flexible, extra strong.
6. *Steel* casting hook block, drop forged *steel* hook.

Send for full specifications—no obligation.

Bring your R & M hoist data files up to date. Send for free bulletin.

☐ Send Bulletin No. 801C ☐ Have Representative call

VENTILATORS MOYNO PUMPS HOISTS CRANES MOTORS FANS

ROBBINS & MYERS INC.

SPRINGFIELD, OHIO BRANTFORD, ONTARIO

Gray Iron mounting plate, for use on a water circulating pump, was cast to shape with holes cored.

Casting or steel plate ...which costs less?

This pump mounting plate when it was flame cut from hot-rolled plate and drilled, cost $1.92.

Then it was redesigned in Gray Iron

Now it costs $1.33 . . . a saving of 30%. The holes are cored and the only finishing on the casting is surface grinding on both sides.

Economy is only one reason for redesigning parts in Gray Iron. This versatile metal can give you strength, rigidity, wear and corrosion resistance . . . and many other unique engineering advantages.

Call your nearest Society member foundry and the full facilities of this association will be available to help you. Or, write direct to Gray Iron Founders' Society, Inc., National City-E. 6th Bldg., Cleveland 14, Ohio, for helpful technical and business information.

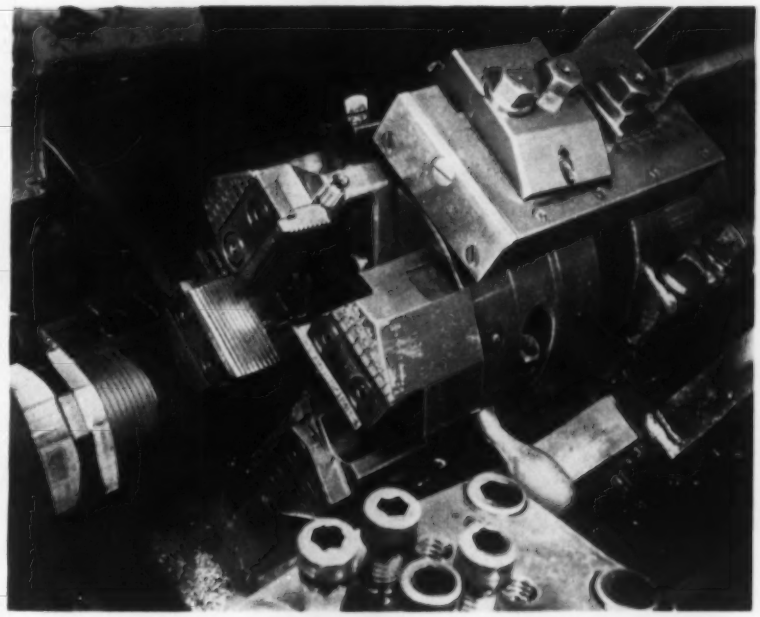
MAKE IT BETTER WITH GRAY IRON

This symbol assures you the most for your casting dollar

Here's why it pays to call in one of the more than 500 leading foundries displaying the Society symbol:

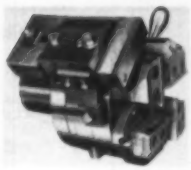
- The most recent technical and business information is available to each member through the Society to help you design better products at lower cost.
- The use of sound cost accounting procedures is recommended and encouraged among Society member foundries, assuring full value for your casting dollar.
- Improved castings result from the advanced techniques and the high sense of responsibility of Society members.

GRAY IRON FOUNDERS' SOCIETY



STAINLESS STEEL TAPERED THREADS

cut with Better Finish, Longer Tool Life



1½" Tapered Pipe Threads are cut in 304 stainless steel reducing bushings at Camden Machine Company, New Haven, Conn. These threads are produced by a 1¼" LANDMATIC Taper Attachment Head on a 3¼" Gridley single-spindle automatic at 15 surface feet per minute.

The thread finish is greatly improved from previous methods and 1000 pieces are completed between chaser grinds—an increase of more than 10 times.

These improved results can be entirely attributed to the use of the Taper Attachment and the free cutting action of the Landis Tangential Chaser. Through the Taper Attachment, cutting action is limited to the throat section or chamfer of the chaser, allowing the thread to be cut quickly with little "cold-working." This action reduces cutting strains to a minimum and results in uniform tapered threads.

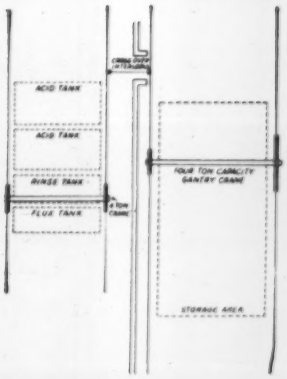
LANDIS Taper Attachment Heads are stationary self-opening heads for cutting tapered threads of all types. Six sizes of heads thread all diameters from ¼" to 6". Ask for Bulletin F-90.

THE WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT - CUTTING - TAPPING - GRINDING - ROLLING

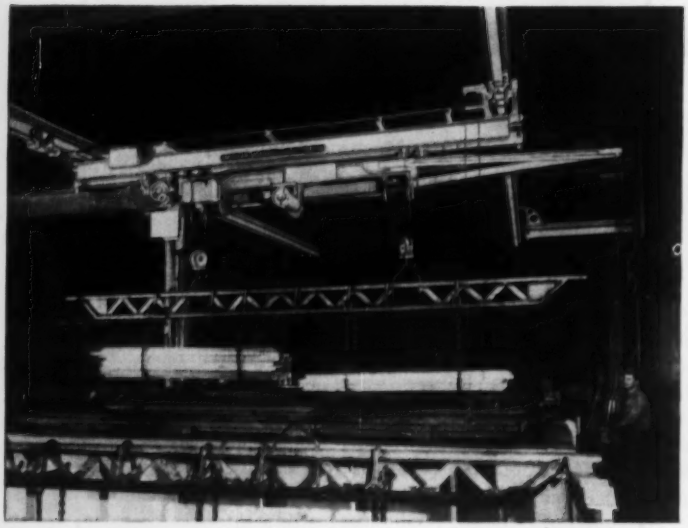
LANDIS *Machine* COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

415



AMERICAN MONORAIL GANTRY CRANE SYSTEM *speeds galvanizing!*



Steel fence posts travel from fabrication to galvanizing over a gantry bridge which interlocks at a crossover track through doorway for passage to the MonoRail crane serving the tanks in the plating room.

All travel on the 4-ton system is motor operated and controlled by push-button station in the operator's hand.

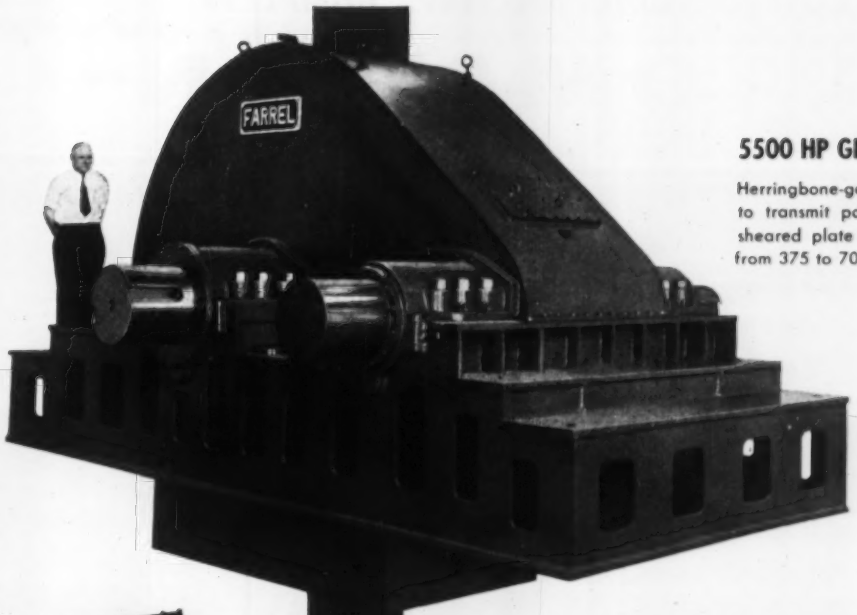
Here is truly team-work handling that results in cost savings as well as increased tonnage through the galvanizing process. It is a typical example of American MonoRail engineering available at no obligation for the solution of your handling problems.

Send for Bulletin C-1 illustrating hundreds of successful Mono-Rail installations.

AMERICAN OVERHEAD HANDLING EQUIPMENT

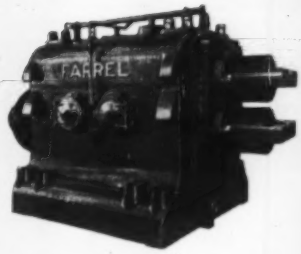
AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE • CLEVELAND 7, OHIO



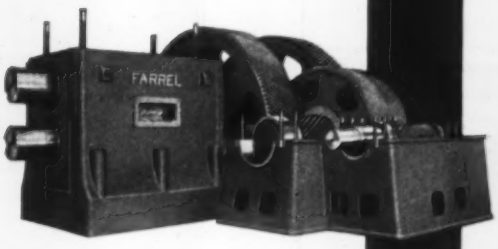
5500 HP GEAR DRIVE

Herringbone-geared reduction unit designed to transmit power to a 134" three-high, sheared plate mill, reducing motor speed from 375 to 70.35 RPM.



2000 HP PINION STAND

21" pinion stand designed to transmit power to a four-high aluminum sheet mill. The heat-treated, forged steel pinions are continuous-tooth herringbone, generated by the Farrel-Sykes process.



2000 HP COMBINATION UNIT

Built to transmit power to a two-high, cold brass, breakdown mill, this combined drive and pinion stand has first reduction gears and mill pinions of the Farrel-Sykes herringbone type, while the second reduction gears are split (divided) double helical.

Every FARREL MILL DRIVE is individually designed

Power and speed, type and gauge of metal to be rolled, process (hot or cold), nature of load (continuous or intermittent), type of drive motor—all are taken into account before the size, material and type of construction are specified.

This development of a Farrel unit, whether it is a gear drive, pinion stand, or combination, assures optimum efficiency, plus the inherent strength to withstand the shocks, stresses and wear encountered in continuous, heavy-duty service.

Herringbone, single helical, or a combination of single and double helical gears may be furnished for gear drives. Mill pinions are usually herringbone type, although single helical pinions can be supplied. These gears and pinions are precision-generated by the famous Farrel-Sykes process, assuring accuracy of tooth spacing, profile and helix angle, resulting in high efficiency, and smooth, quiet operation.

Send today for information on these individually engineered mill drives. Or, if you prefer, a Farrel engineer will be glad to discuss your drive problems with you.

FARREL-BIRMINGHAM COMPANY, INC.

ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N.Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Fayetteville (N. C.), Los Angeles, Houston

FB-990

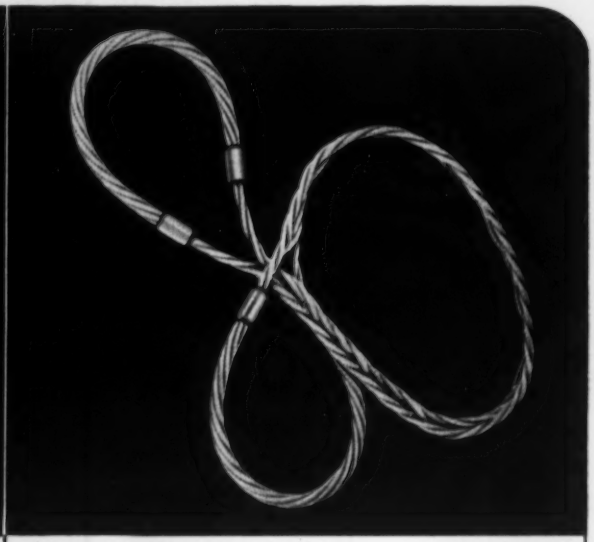
Farrel-Birmingham ®

DO YOU THINK YOU HAVE COMPLETE

AUTOMATION–

IF YOU ARE STILL USING OUTMODED OR OBSOLETE SLINGS FOR RAW MATERIAL, FINISHED PRODUCT OR YARD HANDLING?

THERE'S A ROEBLING SLING as modern as tomorrow for every lifting need – including maintenance for your automated plant – with features for extra safety, handling speed and long life. And in Roebling's complete line are the All-Purpose Sling and the famous "Flatweave" – two slings that are ready to work – to save time and money.



ROEBLING ALL-PURPOSE SLINGS

You can't beat All-Purpose Slings for easy handling. They're flexible...have no servings...no bulging rope sections next to the loop. All wire ends are safely covered by the tapered sleeve. Then, too, All-Purpose Slings are easy to order... they develop the full strength of the rope itself. Their longer service life makes them remarkably economical. And besides, All-Purpose Slings are available as chokers or in any multi-leg construction with a thimble and attached hook, link or shackle.

ROEBLING "FLATWEAVE" SLINGS

Many loads are handled more quickly and economically with these unique slings. "Flatweaves' are exceptionally flexible...can readily be passed through narrow spaces in and under loads. Their broad, flat bearing surface prolongs sling life and practically does away with the need for saddles. Their loops can be used as chokers or slipped over hooks and lugs. Like All-Purpose Slings, Roebling "Flatweaves" come in all standard sizes to speed up your hoisting, loading and moving operations.

Write for the whole story on Roebling slings and sling accessories

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST.• EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

CALENDAR
OF MEETINGS

June 5-8, American Gear Manufacturers Association: Annual meeting, the Homestead, Hot Springs, Va. Association's address: 1 Thomas Circle, Washington 5, D. C. Secretary: John C. Sears.

June 5-9, American Society of Mechanical Engineers: Annual oil and gas power conference, Hotel Statler, Washington. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

June 6-9, National Industrial Service Association Inc.: Annual convention and exhibit, Hotel Statler, Los Angeles. Association's address: 818 Olive St., St. Louis 1, Mo. Secretary: Fred B. Wipperman.

June 7-10, American Welding Society: National spring meeting and exposition, Municipal Auditorium, Kansas City, Mo. Society's address: 33 W. 39th St., New York 18, N. Y. Secretary: J. G. Magrath.

June 12-17, Society of Automotive Engineers Inc.: Summer meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

June 13-17, Technical Writers' Institute: Rensselaer Polytechnic Institute, Troy, N. Y. Information: Jay R. Gould, director, Technical Writers' Institute, Rensselaer Polytechnic Institute, Troy, N. Y.

June 13-17, American Society of Civil Engineers: Spring meeting, Jefferson hotel, St. Louis. Society's address: 33 W. 39th St., New York 18, N. Y. Secretary: Col. Wm. N. Carey.

June 13-17, National Association of Power Engineers Inc.: Annual meeting, Waldorf-Astoria hotel, New York. Association's address: 176 W. Adams St., Chicago, Ill. Secretary: A. F. Thompson.

June 14-16, Radio-Electronics-Television Manufacturers Association: Annual meeting, Palmer House, Chicago. Association's address: 777 14th St. N.W., Washington 5, D. C. Secretary: James D. Secrest.

June 14-16, American Institute of Electrical Engineers: Magnetics conference and exhibit, William Penn hotel, Pittsburgh. Institute's address: 36 W. 46th St., New York 36, N. Y. Secretary: N. S. Hibshman.

June 15-17, American Marketing Association: National conference, Schroeder hotel, Milwaukee. Association's address: David Kinley Hall, University of Illinois, Urbana, Ill. Secretary: Harvey W. Huegy.

June 15-17, American Society of Mechanical Engineers: International conference on combustion, Massachusetts Institute of Technology, Cambridge, Mass. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

June 15-17, American Society of Training Directors: Annual meeting and exhibit, Los Angeles. Society's address: 2020 University Ave., Madison 5, Wis. Secretary: Walter H. Kee.

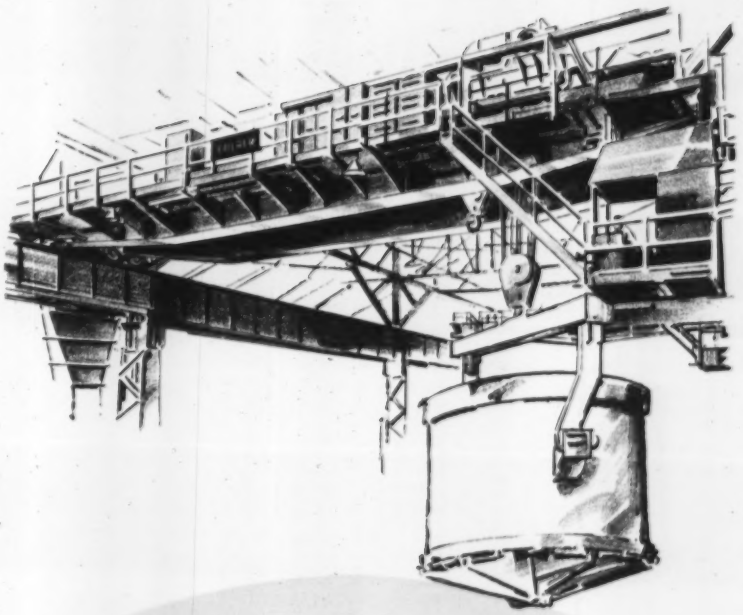
June 16-17, Machinery & Allied Products Institute: Annual meeting, Hotel Statler, Washington. Institute's address: 1200 18th St. N.W., Washington 6, D. C. Secretary: Charles W. Stewart.

June 16-18, American Society of Mechanical Engineers: National applied mechanics conference, Rensselaer Polytechnic Institute, Troy, N. Y. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

June 16-18, Malleable Founders' Society: Annual meeting, the Greenbrier, White Sulphur Springs, W. Va. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Managing director: Lowell D. Ryan.

June 18-23, Caster & Floor Truck Manufacturers Association: Summer meeting, aboard ship, en route to Bermuda. Association's address: 27 E. Monroe St., Chicago 3, Ill. Executive secretary: Harry P. Dolan.

June 19-22, Drop Forging Association: Annual meeting, Grove Park inn, Asheville, N. C. Association's address: 605 Hanna Bldg., Cleveland 15, O. Secretary: Raymond M. Seabury.



Steel mill service is TOUGH service!

When an EDERER crane is "job-engineered" for steel mill service—it is designed and built to do its job day-in-day-out, 365 days a year—with no down time for maintenance. Every detail of oversize construction throughout meets—or exceeds—AISE specifications. Operating speeds are carefully calculated for the exact requirements of the job to be done. Result? A crane that really gives heavy-duty performance.

EDERER can "job-engineer" a crane to perform with equal ability in YOUR plant—YOUR industry. Our industrial crane catalog will give you details.

EDERER industrial crane catalog—Bulletin CR-610—gladly sent to you on request.

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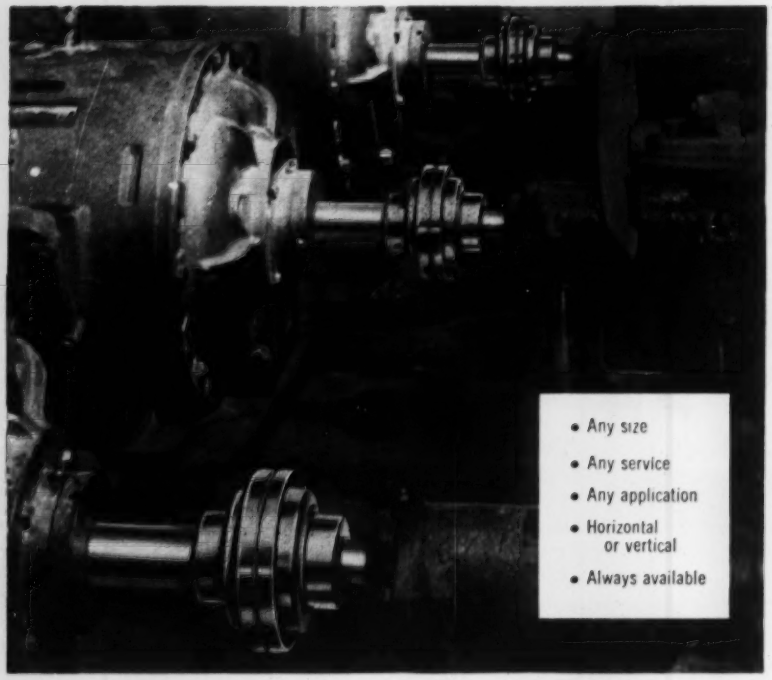
EDERER ENGINEERING COMPANY
2935 First Avenue South
Seattle 4, Washington
EXPORT DIVISION:
301 Clay Street, San Francisco 11, California

EDERER CRANES

OVER 53 YEARS "JOB-ENGINEERING" CRANES FOR INDUSTRY



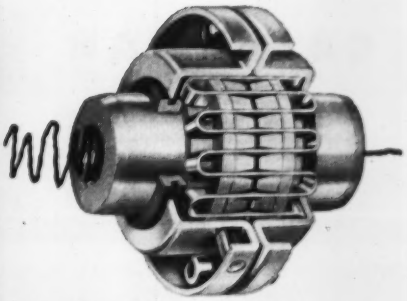
FALK Steelflex Couplings save you money by prolonging the work-life of connected machinery

Ever since the first Falk Steelflex Coupling was designed and built, more than thirty years ago, we have firmly held to these beliefs:

1. A coupling, to give fullest value, must do more than merely connect driving and driven machinery—it must protect the machinery and prolong its life.
2. A coupling, to be truly flexible, must overcome the effects of shock and vibration, as well as shaft misalignment (see column at right).

Proof of the soundness of these beliefs is furnished by the record. Many Falk Steelflex Couplings installed 10, 20, even 30 years ago are still giving trouble-free service—still providing maximum protection for the machinery they connect!

A single basic type—the world-famous Type F—fills nine out of ten industrial application needs. Versatile, efficient and economical, it is always quickly available, in a wide range of sizes, regardless of your location. Write to Department 247 for engineering bulletin, including selection and dimension details.

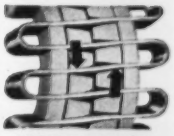


How Torsional Resilience smothers shock and vibration

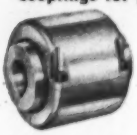
The steel gridmember connecting hubs fits snugly only at outer edges of tapered hub-teeth. As load increases, gridmember flexes against teeth in proportion to load, providing cushion that spreads peak loads over longer time increment and reduces stresses in machinery.

...Accommodates shaft misalignment... Permits free end float

The exclusive FALK all-steel grid-groove design provides compensation for parallel and angular shaft misalignment . . . permits free end float.



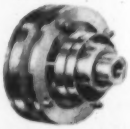
Special or Dual Purpose FALK Steelflex Couplings for problem applications

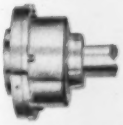

LIMITED SPACE
Type FS

RAPID REVERSING SERVICE—Type CM

HIGH SPEEDS
Types H and HH

BRAKEWHEEL SERVICE
Type BW


OVERLOAD CONTROL
Type FT


EXTENDED SHAFT
Type P

FLOATING SHAFT
Type PP

Do you have a coupling problem?

If so, describe it in writing—we will gladly recommend the proper Steelflex coupling for your needs. Write to Department 247.

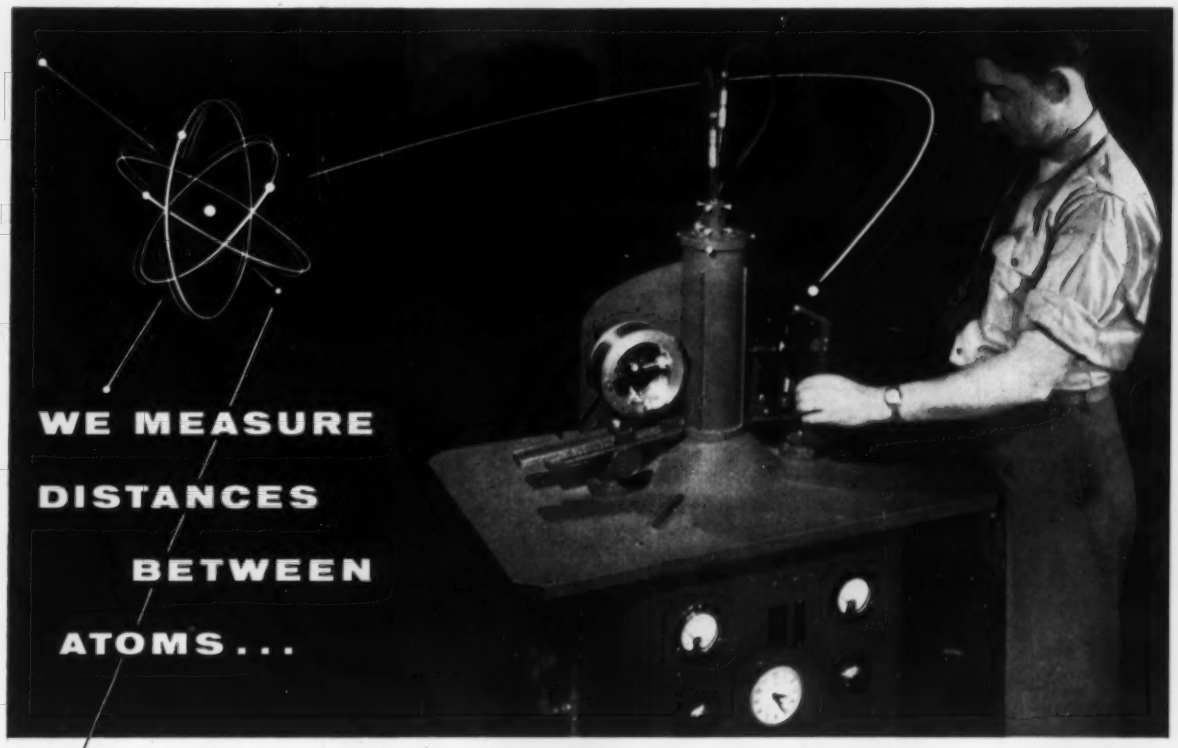
THE FALK CORPORATION, Milwaukee 8, Wisconsin

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

...a good name in industry

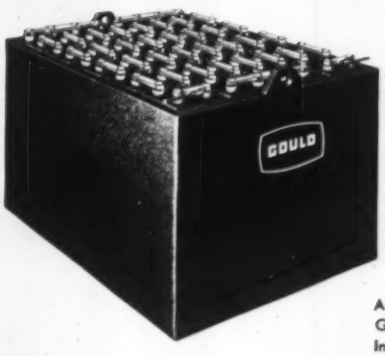


TO GIVE YOU *Advance Design* BATTERIES!

The X-Ray Diffraction Unit shown above is one of the few instruments of its kind being used in basic battery research. It identifies complex metallic compounds which cannot be identified practically by chemical means. It does this by actually indicating on film the distances between atoms, enabling Gould engineers to study atomic structure.

This instrument . . . this research . . . is revealing hitherto unknown facts about the relationship between molecular activity and battery performance . . . pointing the way toward more powerful, longer lasting active materials. That's why you get *better* batteries when you buy Gould!

For the full story on Gould Research, send for Booklet 749.



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Industrial
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Always Use Gould-National Automobile and Truck Batteries

Announcing
SHELL
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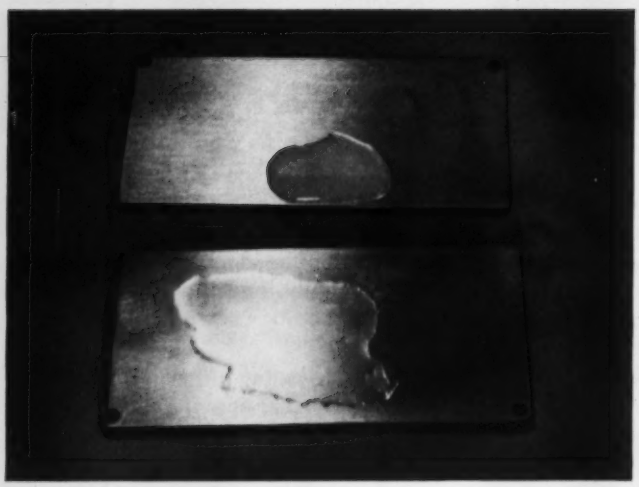

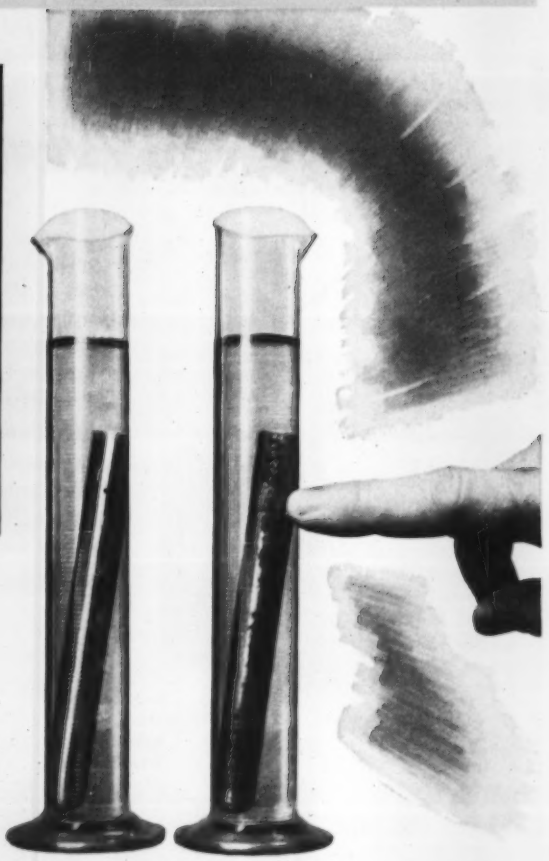

Above: Cooling action of a cutting fluid is directly related to its wetting ability. Conventional soluble oil emulsion (background) "balls" up. Equal amount of Shell Dromus Oil E spreads out thinly . . . wets far greater area.

Right: Plain carbon steel, if left in water at room temperature for about two hours, will rust as shown. Sample on left was in a 1-30 solution of Shell Dromus Oil E and water *for six months without rusting.*

SHELL DROMUS OIL E

NEW CUTTING OIL

permits higher speeds and faster feeds than ever maintained before

Shell Dromus Oil E, a new solution-type fluid, wets all metal surfaces with extreme rapidity and keeps both work and tools exceptionally cool. These qualities permit an increase of machine speeds and/or feeds far beyond anything allowable with conventional soluble oils.

IT'S MUCH EASIER ON TOOLS

There's much more life in any cutter or abrasive wheel when protected by this new oil. *It stays put* between tool and work. (At a 1-30 dilution, average tool life increase in extended field tests was about 50%.)

IT FIGHTS RUST

Shell Dromus Oil E is readily soluble in hot, cold, soft or hard water, and stable in any concentration. Even at low concentrations, it gives excellent rust protection to all ferrous metals, *including cast iron.*

IT KEEPS WORK COOL

Even at stepped-up production rates, you'll find less heating and better finish wherever this new oil is used.

IT SETTLES OUT FAST

Chips and wheel particles settle out immediately . . . the recirculated fluid is clean and free from contaminating particles. It is *not* sticky or greasy . . . leaves no deposits on machines or work.

IT'S GREAT FOR GRINDING

Grinding wheels remain clean, *even when material retains a film of cutting oil from a previous operation.* Even cast iron can be ground cleanly when Shell Dromus Oil E is used to cool the work.

If all this reads "too good to be true," we suggest that you try Shell Dromus Oil E *on any problem operation you have.* It *is* that good!

SHELL OIL COMPANY

50 West 50th Street, New York 20, New York
100 Bush Street, San Francisco 6, California

SHELL

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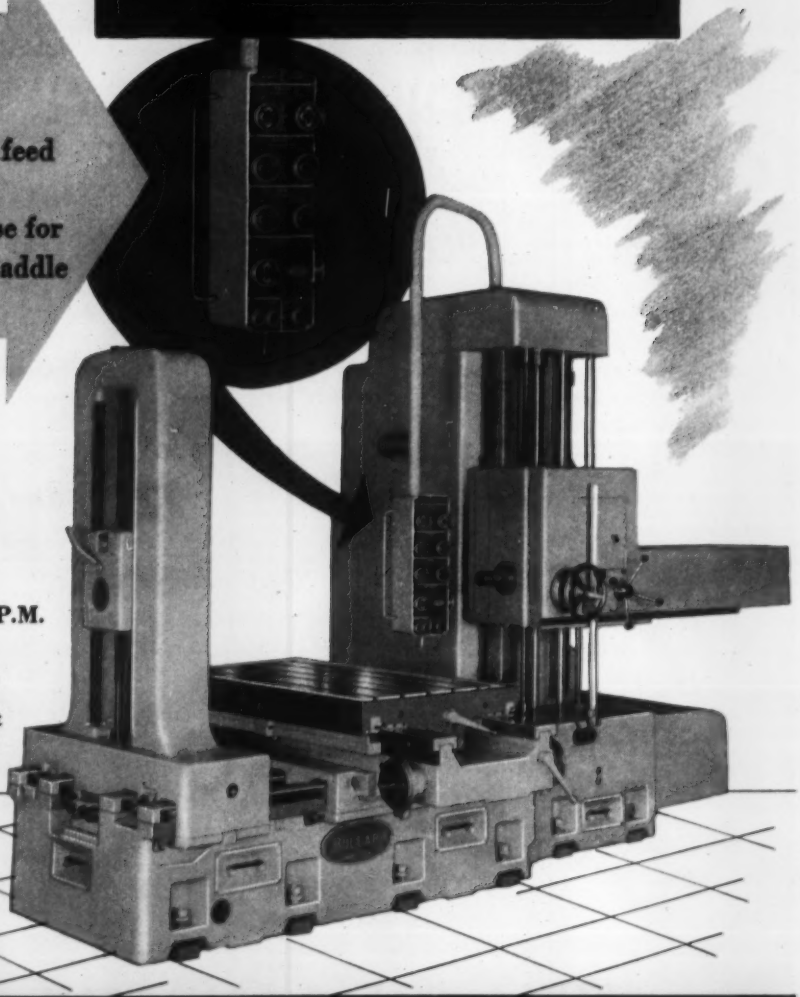
SEVENTY FIFTH
1888 BULLARD 1888
ANNIVERSARY

3 11 HORIZONTAL BORING MILLING and DRILLING MACHINE

PENDANT CONTROL
Complete **machine control from a movable station for feed and speed selections, directional feed and traverse for Spindle, Head, Table and Saddle**

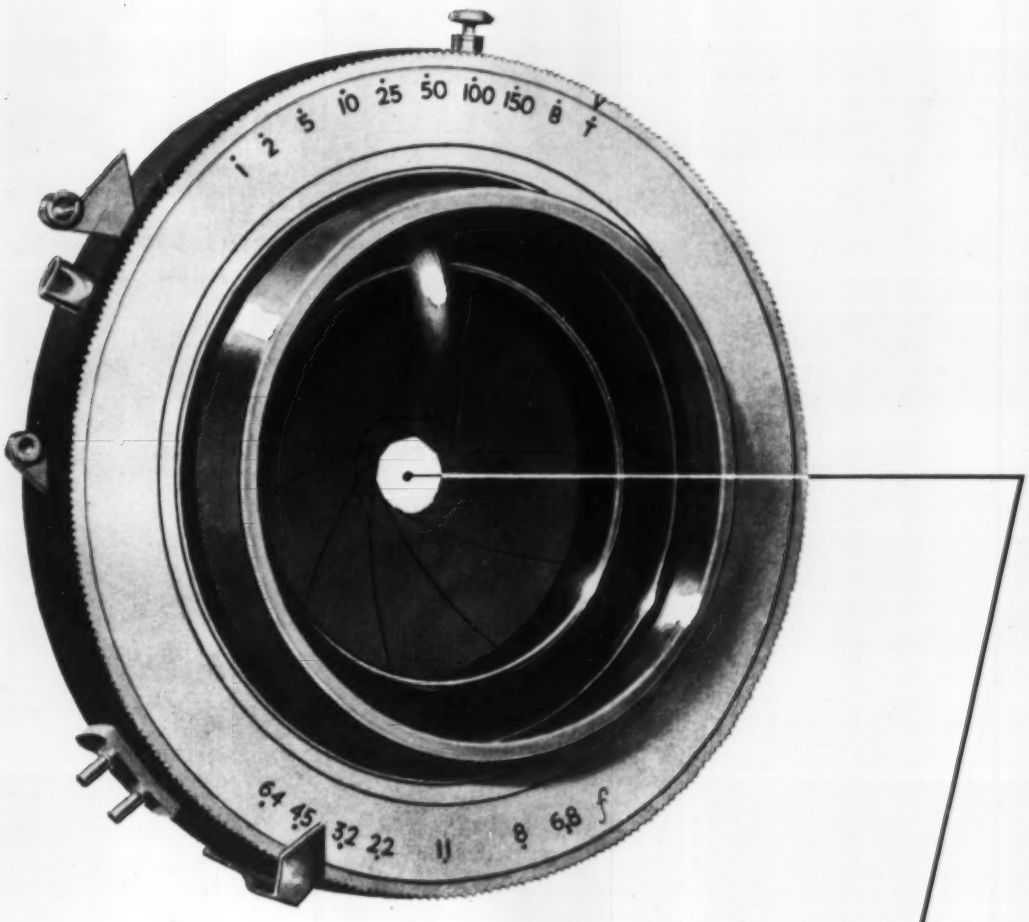


ADDITIONAL FEATURES

- Both Screw and Rack Feed to the spindle
- Massive 4-Way Bed, Head, Headpost and Rear Post for rigidity
- Spindle Speed up to **2000 R.P.M.**
- Replaceable Ways, chrome hardened, on Bed and Saddle
- Optical measuring equipment for head and table (optional)

FOR FULL INFORMATION CALL YOUR NEAREST BULLARD SALES OFFICE, OR DISTRIBUTOR OR WRITE . . .

THE BULLARD COMPANY | BRIDGEPORT 2, CONNECTICUT



We roll tissue-thin steel so flat

a camera's eye shuts tighter

● Camera shutters are incredibly fast and accurate. To permit this speed and precision, *Athenia Steel Division* rolls tough alloy steel to a thickness of .002″ . . . with a tolerance of only .0001″.

But the toughest part of the job is keeping the steel extremely *flat*. It requires skill of the highest order, plus constant supervision and meticulous control.

The *Athenia Steel Division* of National-Standard produces this steel for the foremost camera makers, meeting these really tough specifications better than they've ever been met before.

Tough jobs like this are routine at *Athenia*. We can roll the fussiest kinds of steel to remarkable tolerances.

We can meet any demands for high carbon strip steel. But we excel at producing the types with specifications so extreme that other manufacturers cannot or will not meet them. And we are just as eager to serve the small manufacturers as the big ones. Write us and see.

NS
NATIONAL-STANDARD Company
NILES, MICHIGAN

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Tire Wire, Stainless, Fabricated Braids and Tape
ATHENIA STEEL DIVISION • CLIFTON, N. J.
Flat, High Carbon, Cold Rolled Spring Steel
REYNOLDS WIRE DIVISION • DIXON, ILLINOIS
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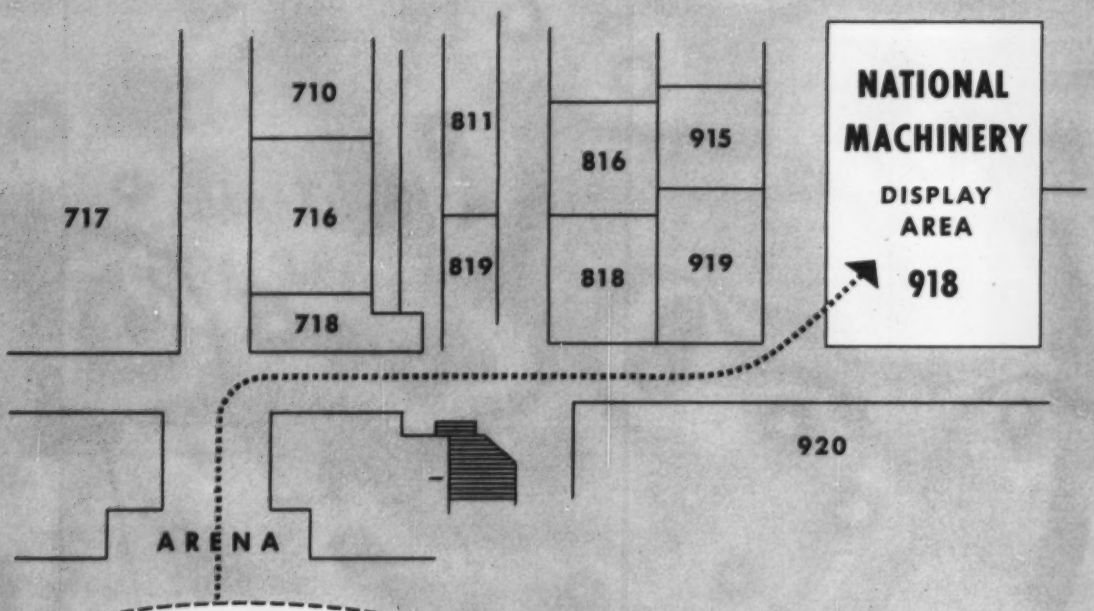
Special Machinery for Metal Decorating
WORCESTER WIRE WORKS DIVISION • WORCESTER, MASS.
Round and Shaped Steel Wire, Small Sizes



DISPLAY AREA 918 . . . PROGRESS IN FORGING

AT THE MACHINE TOOL SHOW,

CHICAGO, SEPTEMBER 6 TO 17!

We at National Machinery, WHQ*
for the development of advanced methods
and machinery for the forging industry,
for more economically producing
a wide variety of parts—
routine or unusual, ferrous or non-ferrous,
automatic or semi-automatic,
by cold forging or hot forging—
invite you to visit our working exhibit
at the coming machine tool show,
the first in seven years!

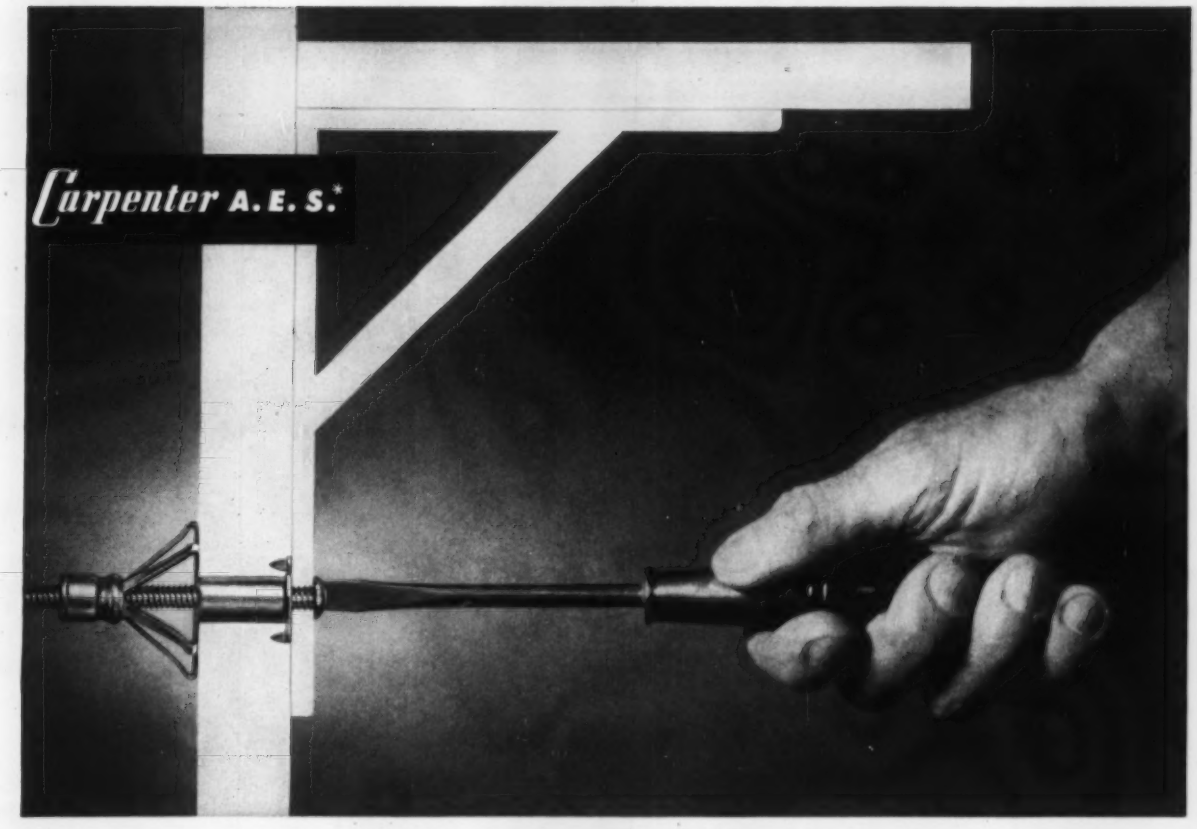
*WORLD HEADQUARTERS

NATIONAL
MACHINERY COMPANY

TIFFIN, OHIO—SINCE 1874

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS • BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS

Hartford Detroit Chicago



Help for Handymen at Home

*Another example of how Carpenter *Application Engineering Service is helping industry cut costs.*

Ever try to turn a screw through plaster into a hollow wall? The result is usually disastrous . . . unless a device, such as this patented screw anchor, is used. With this anchor it's an easy matter to drill a hole, insert the device, then turn it tight. And it holds securely. But you'd be surprised at the production problems involved, even with a small item like this. For example, it's a highly competitive product turned out in huge quantities. This means that the tools and dies used to make it have to be just right—they have to hold sharpness, be accurate, provide adequate toughness, and hold up in the presses with no trouble while producing millions of parts.

To help control production costs, the manufacturer called on Carpenter Application Engineering Service for counsel in selecting die steels for the different sections of the progressive dies. A.E.S. supplied the answer—recommended five different steels in the Carpenter Matched Set . . . each engineered to perform its job best. Here, in the manufacturer's words, is the result: "With the help of Carpenter die steels we've been able to control our production costs so closely that there has been no price increase in the last five years!" (A detailed Field Report on the tooling for this job is available on request.)

Time and again, industry is finding new ways to hold costs in line and improve product sales with the help of Carpenter Application Engineering Service. A.E.S. is a service backed by almost 70 years of leadership in specialty steel development. It embraces trained Field Engineers, experienced representatives, competent Mill Metallurgists ready to work with you for best results. A.E.S. starts with your first call to Carpenter. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

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T-V makers keep a Clear Picture of Assembly Costs . . . with AMERICAN PHILLIPS Screws

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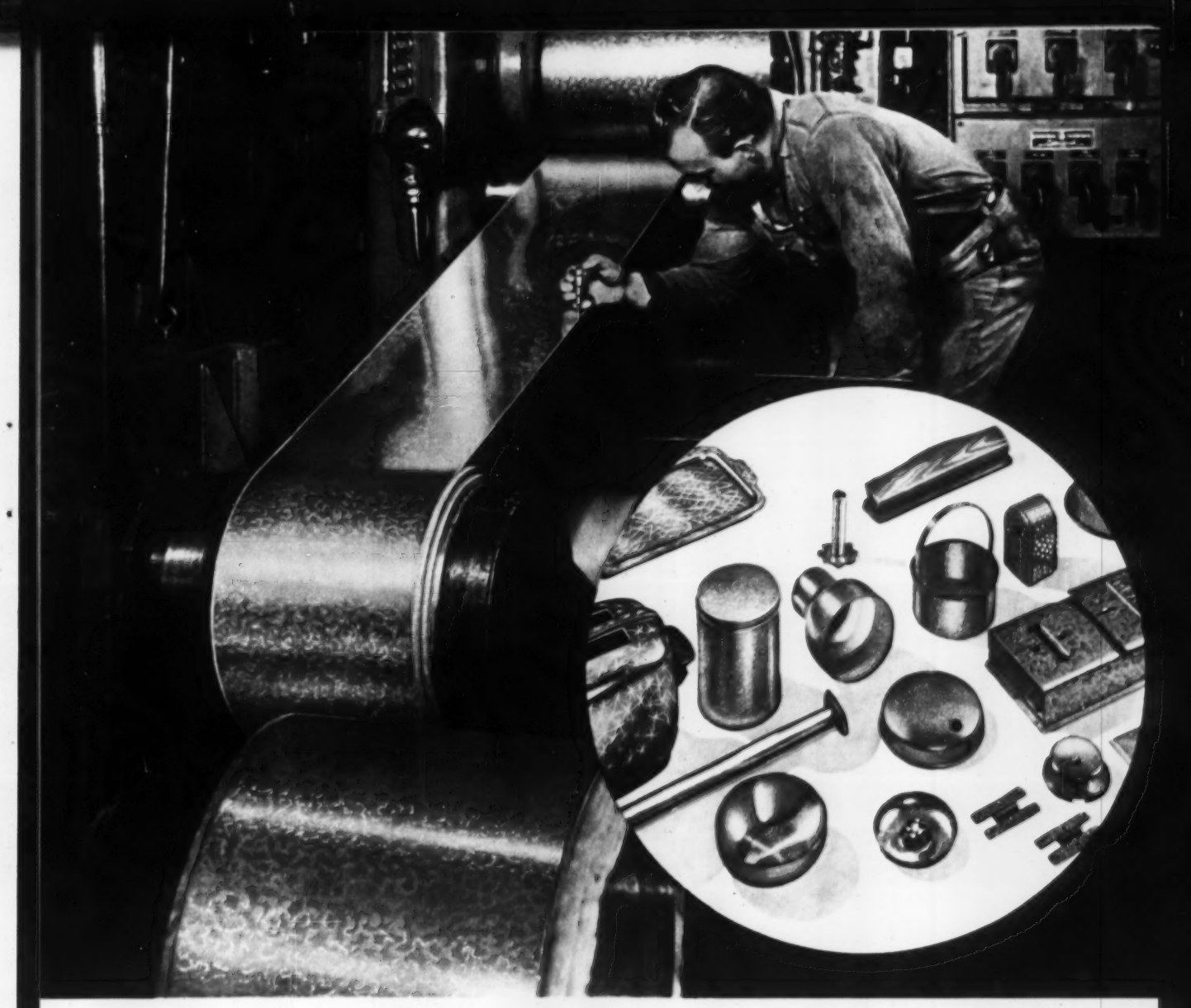

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- You can use it as plain uncoated steel or have it electrolytically coated with copper, brass, nickel, chrome, zinc or lead alloy . . . hot dip coated with lead alloy or tin . . . lacquer coated, either clear or colored.
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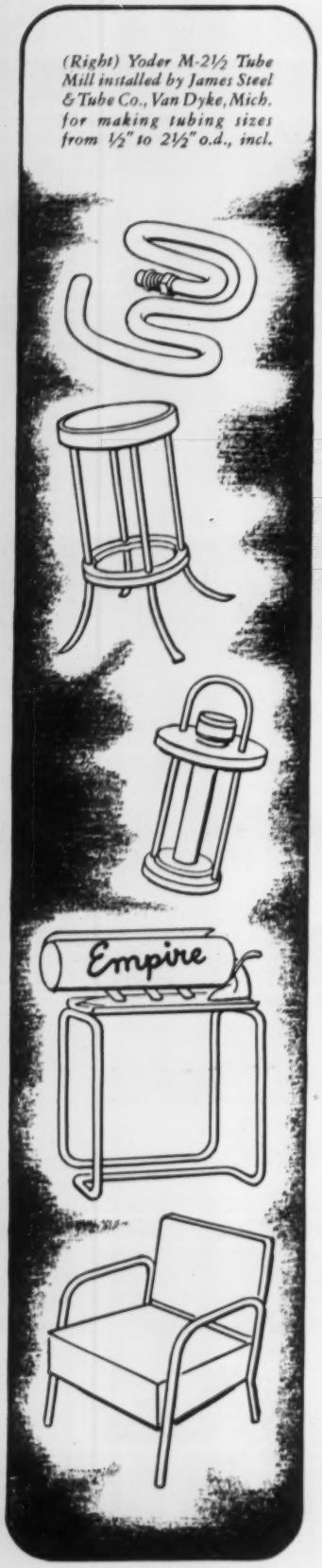
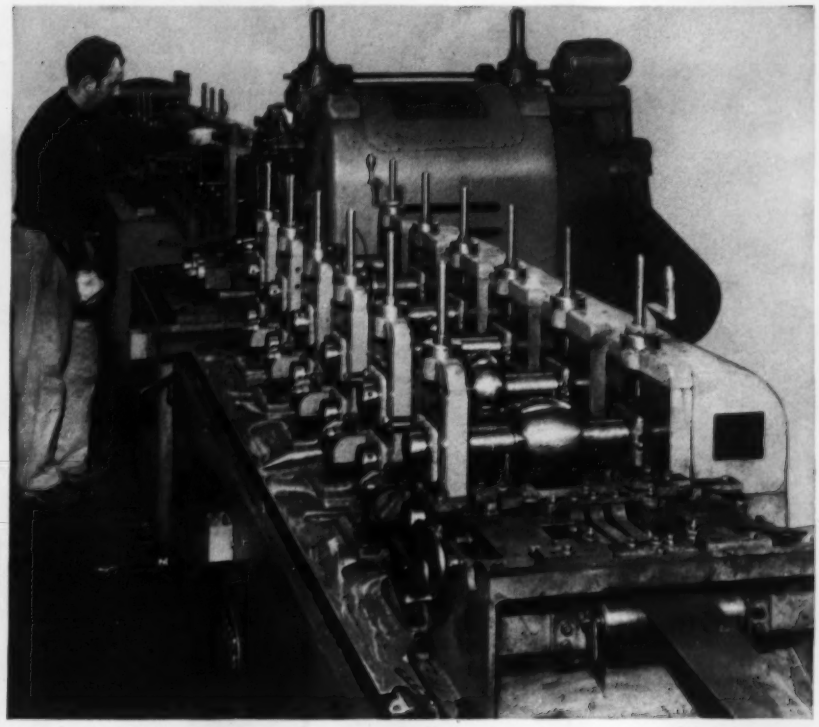


(Right) Yoder M-2½ Tube Mill installed by James Steel & Tube Co., Van Dyke, Mich. for making tubing sizes from ½" to 2½" o.d., incl.



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Yoder tube mills excel in all these respects and have other mechanical, electrical and economic advantages. Because Yoder tube mill owners have found from experience their performance is as good as our promise, there are more Yoder mills sold and in operation than all other electric-weld mills combined. This is as true today as it was ten years ago.

If you want the plain facts about the things to look for in a tube mill, to insure most profitable operation over the years, the new Yoder Tube Mill Book will give them to you, in the simplest language and with numerous illustrations.

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COLD ROLL FORMING PRODUCTION LINES

ENGINEERING YODER MANUFACTURING

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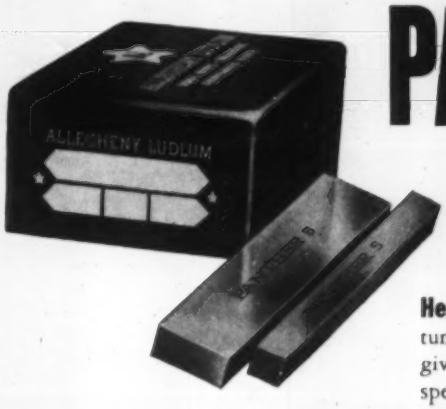

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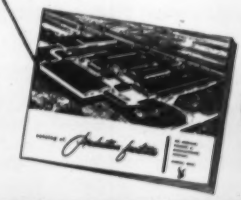

AMERICAN WELDING

THE AMERICAN WELDING AND MANUFACTURING CO. • 110 DIETZ RD. • WARREN, OHIO

Metalworking Outlook

Wage Settlements Rise

Wage settlements are slightly higher thus far this year, compared with the first five months of 1954. In a summary of settlements in early 1955 for northern Ohio companies, Associated Industries of Cleveland finds that the weighted average of firms granting boosts is 6.09 cents per hour, against 6.07 cents in early 1954 and 8.32 cents in early 1953.

Two Plants Close

Labor problems were a major cause in the closing of two Michigan plants late last month. Calumet & Hecla Inc. authorized the liquidation of its strikebound Calumet, Mich., division which produces copper. Eaton Mfg. Co. said high labor costs had forced it to close its foundry division in Vassar, Mich., by June 1. United Steelworkers' Local 4312 was demanding wage and fringe increases costing 82 cents an hour at Calumet. Eaton charged that AFL-United Auto Workers' Local 564 showed "no desire" to modify a contract calling for wages of $2.67 an hour. The foundry industry average is $1.92 an hour, says Eaton.

Lots of Money

By June 30, the Defense department will have a total unexpended balance of $46 billion, of which $11.5 billion will be unobligated. Since the start of the Korean War, $230 billion has been made available for Pentagon spending. Of that, $178 billion has been spent, some $6 billion has lapsed and reverted to the Treasury.

Are You in Step?

Industry, government and other organizations will spend three times as much for research in 1965 as now. They paid out $4.5 billion last year (page 52) and will spend an estimated $13 billion ten years from now. Will your research triple by then?

Changing Times

Fifteen years ago the U.S. was a net exporter of copper. Today, it is a major importer. Compared with 15 years ago, our imports of aluminum and bauxite have increased seven times; our imports of ferroalloys have jumped ten times; iron ore four times. The nation in 1900 produced 15 per cent more than it consumed in all raw materials except foodstuffs, gold and silver. In 1950 it consumed 9 per cent more than it produced. That percentage may rise to 20 by 1970.

Windfall in Copper

Miami Copper Co., Copper Range Co. and Howe Sound Co. made sales that were about $400,000 higher than expected because of action called "a mis-

take" by Defense Mobilizer Arthur S. Flemming. The three were scheduled to deliver copper to the stockpile at prices ranging from 27.35 to 32 cents a pound during this quarter. The Office of Defense Mobilization authorized cancellation of those deliveries and diversion to hard-pressed civilian consumers. Copper's price on the open market at the time of cancellation was 36 cents a pound. The situation won't recur. Hereafter, Dr. Flemming will authorize deferment, not cancellation, of scheduled stockpile deliveries.

More Metal for Planes

The Air Force will begin using more metals, particularly aluminum, nickel and titanium, beginning about the fourth quarter. Reason: The decision to speed production of the B-52 intercontinental bomber by 35 per cent. The increased consumption will be caused by faster production of B-52s, not any greater output of that aircraft.

Explanation for Senator Kilgore

Auto and steelmen will testify this week before the Senate Judiciary Antitrust & Monopoly Subcommittee. Officials from the six auto assemblers, Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. will be on hand. Says Committee Chairman Harley Kilgore (Dem., W. Va.): "We have called these men to get a picture of their industries which will aid us in understanding the action of the executive branch in approving two mergers in the automobile industry, while disapproving a proposed merger in the steel industry."

Straws in the Wind

Profits made by makers of aircraft and components for the Air Force face two House investigations—by the Appropriations Committee and by an Armed Services subcommittee . . . Operatorless elevators now account for 92 per cent of all passenger elevator sales in the U.S., reports Westinghouse Electric Corp. . . . The first certificate awarded by the Civil Aeronautics Administration for commercial operation of a turboprop engine has been issued to General Motors Corp.'s Allison Division . . . In the first three months, 3068 LP-Gas tractors were sold, compared with 1283 in the same 1954 months . . . U.S. Steel Corp. and United Steelworkers of America are scheduled to begin wage talks tomorrow, June 7.

This Week in Metalworking

The nickel shortage will continue until 1958 (page 47) . . . Purchasing agents predict continued good business in the second half (page 49) . . . Printing machinery sales climb (page 50) . . . Higher technical standards help reconditioners of used drums (page 51) . . . ODM seeks more steel expansion (page 52) . . . Inland Steel Co. starts moving a lake to dredge for iron ore (page 53) . . . Resurging railroad profits brighten equipment-buying prospects (page 57).

having trouble getting steel?

In the face of high demand, some steel users are finding it difficult to get just what they need when they need it. If you are having trouble meeting current steel requirements we probably can help you. Here's why:

First, despite the fact that our own stocks have been hard hit in spots, we still have the world's largest inventories of carbon, alloy and stainless steel on hand—thousands of tons—and these stocks are being replenished daily.

Second, when local shortages do occur your nearby Ryerson plant can draw on stocks at fifteen other Ryerson plants and, in this way, can often take care of customers who would otherwise have to delay production or maintenance work.

Third, when the exact kind or size you need is not on hand, experienced Ryerson steel men can often supply a practical alternate from our large, diversified stocks. For example, heavy carbon steel plate, sheared into flat bars—or straight-chrome stainless to replace chrome-nickel types, etc.

And most important, you can depend on Ryerson to maintain positive control over the quality of your steel. In specifying, in handling, in cutting, first emphasis is always on quality under the Ryerson Certified Steel Plan. So whether or not you are having trouble getting steel, you will find our unequalled stocks, extensive facilities, and experienced organization are your most dependable source for help on steel problems.

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COLD ROLLED STRIP STEEL
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Standard or Production Sizes
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gives engine bearing maker

99.86%

on-the-job performance

Here's a customer who manufactures precision engine bearings. During 1954 we shipped him 1,225,589 pounds of DSC STRIP for "backs."

Widths ran from 4″ to 9″; thickness, from .050″ to .156″. All gauge tolerances had to be held ± .001″ or .002″ overall. That's "more restricted than standard" by as much as 66 2/3%. Standard tolerances for the specified sizes are .004″ and .006″ overall.

Of the total weight shipped all but 1,685 pounds proved right-on-the-nose for gauge, width, temper and finish . . . a score of 99.86% for on-the-job performance.

This tells the experience of only one of our customers to whom we shipped over 500 tons apiece last year. The fact is that three out of every five of such accounts scored DSC STRIP *higher than 99%* for job-performance and nearly half of them didn't reject a single pound or claim a dollar's allowance of any kind.

Whether your jobs call for standard or closer-than-standard thickness tolerance, light or heavy gauge, satin or bright finish, low carbon or high carbon spring steel . . . this is the kind of performance DSC STRIP gives you consistently when the tools, the job and the steel are properly mated.

Your nearest DSC Customer Representative will appreciate the chance to talk over with you the possibilities on your jobs.

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What Is Management?

With the rapid technological progress and marked sociological changes now under way in America, there is need for a clearer concept of management and its functions.

To many, management encompasses only top executives. To some, management reaches down as far as the operator of the individual machine. To others, management represents the monied interests of capital.

None of the definitions fits. In the last several years, management has emerged as a professional group with special skills and talents.

Except in small organizations, management activities have become too complex and diversified for one or two top executives. More and more, these activities are being shared by a management team. Large companies are even setting up departments as separate, autonomous businesses in cities miles apart.

Among professional management's functions and responsibilities is the creation of a want for its products. A business is based on customers. Production is meaningless without them.

Products, unheard of only a few years ago, are in great demand today. Many will give way to still newer ones yet to come.

The evolution of a new product to fill a want begins with market research and carries on through design, engineering development, production and sales. Every step along the way requires careful consideration of materials, production methods, prices and channels of distribution.

It means keeping a weather eye on competition, the limitations of a budget, projected profits and worker attitudes. It means a multitude of individual and group decisions by the men in charge of administration, production, engineering, research, purchasing, marketing and sales. Others with management responsibilities, such as technical service directors, staff engineers and materials handling engineers, play their part, too.

Management is the group in a business enterprise that directs the ceaseless experimentation and invention, the expanding investment in new plants and equipment which result in greater productivity and improved products.

The management team functions for the benefit of its customers, its workers and stockholders.

Its role will grow in importance, not diminish.

Irwin H. Such
EDITOR

Inland's production balance, ever-sensitive to the varying requirements of midwestern industry for a wide range of carbon steel products, is a real advantage to steel users.

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Principal Products: Sheets • Strip • Structural
Shapes • Plates • Bars • Tin Mill Products • Rails
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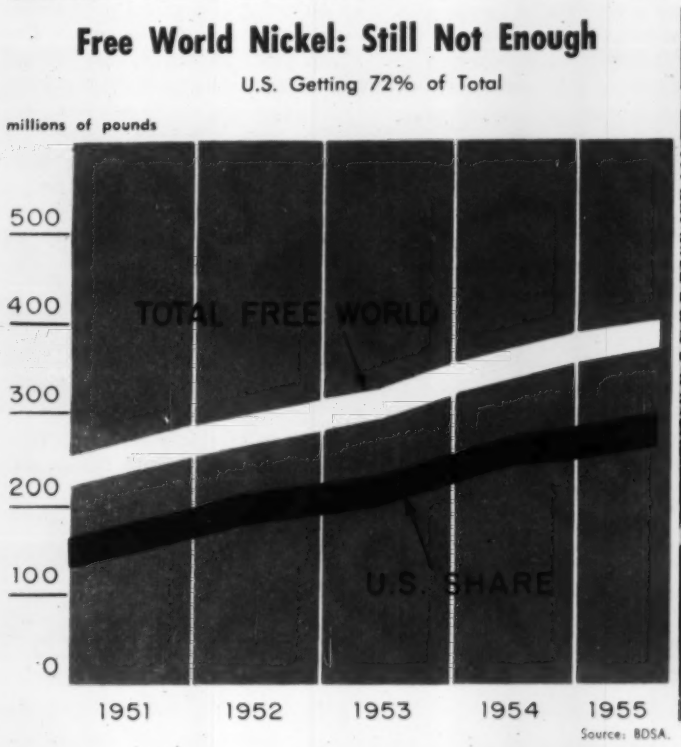


Nickel Shortage Until 1958

That's the outlook now, but some relief will come by late 1956 or early 1957 as new capacity comes in. A major reason for the scarcity: The metal's popularity as an alloying element

NICKEL was the last major metal to be decontrolled, and it may be the first to be controlled again.

That's the talk in Washington as nondefense users of the metal see inventories shrinking to dangerous levels. Defense Mobilizer Arthur Flemming may appoint a committee soon to advise him if and when there should be controls.

Relief Schedule—Despite the release of more metal in June (STEEL, May 23, p. 146), top-level government planners see no letup in the critical situation until late in 1956. Even if present expansion projects develop fully, the shortage won't be over until 1958.

There are four basic reasons for this shortage. Foremost is the essential stockpile program, without which there would be no shortage.

Still Tops — Second, most defense producers prefer nickel as an alloying element because it works consistently in high-speed, high-altitude aircraft. The military is seeking more instead of less nickel.

Third, civilian uses of nickel are increasing, especially for stainless steel, its biggest consumer. Platers, especially automotive, still haven't found an acceptable substitute.

Insurance Orders—Last is the suspicion that users, both civilian and defense, are overordering in an effort to assure themselves of an adequate supply.

Some Office of Defense Mobilization officials look on the shortage as a temporary situation and believe some help should be given to tide over nondefense users. But others believe that if the general economic level in the second half even approaches that of the first half, controls will be necessary to keep a bad situation from getting worse. Even an auto strike, they feel, would produce nothing more than a temporary respite.

Allocation a Possibility — One stainless steel producer told STEEL that to his knowledge no stainless plants have been closed down for lack of nickel. But inventory is down to a month, which holds producers in check on new business. "If something isn't done within the next 30 days," he said, "we all will have to resort to outright allocation of our production."

Platers are working on an inventory of two to three weeks, says Raymond Shock, a former official of National Association of Metal Finishers. The 1-million-lb-a-month extra metal for February through May didn't have much effect on the thousands of small plating shops. The extra 3 million lb scheduled for June should be of some value. But Mr. Shock sees the shortage lasting into 1956.

Long-Term Proposition—Permanent relief in nickel can be seen in the long view, however. But first the stockpile program must be completed (most guesstimates are

about 1958). New capacity being developed, most of which is under government contract, is coming in slowly because of technical difficulties.

Nickel is one of the most difficult metals to refine. It usually is found in a complex ore with other metals, and each ore body has its peculiarities which necessitate unusual methods of recovery. But these problems are being solved.

For instance, the M. A. Hanna Co., Cleveland, is just beginning production at a plant in Riddle, Oreg., which was started in 1953. Full operations will be reached some time next year. The product is ferronickel ingots containing 40 per cent nickel, which will be especially useful to the stainless steel industry. When government obligations are taken care of, this may be the No. 2 source for U.S. nickel users—next to International Nickel Co. Inco itself is contributing to the increase in facilities, carrying out constant exploration for new deposits. The Sudbury district of Ontario, northern Manitoba and the Lynn lake areas are expected to contribute heavily to Inco's capacity in the future.

Other Sources — Falconbridge Nickel Mines Ltd. is expanding to an ultimate production of 55 million lb a year, which will be reached about 1960. A small amount of nickel in the form of metallic powder—about 1.8 million lb annually—can be counted on in a year or so from National Lead Co.'s nickel-cobalt-copper refinery at Fredericktown, Mo.

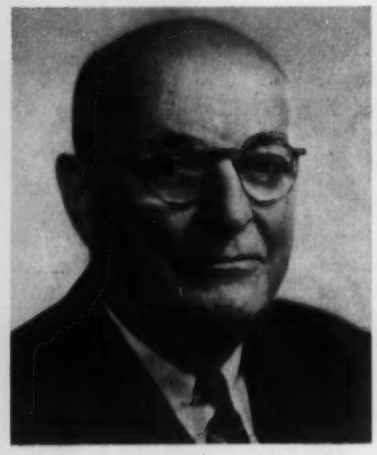
The government's plant at Nicaro, Cuba, is undergoing a 75-percent expansion which will raise its annual capacity from 28 million lb to about 50 million lb. Production is divided between nickel oxide powder (which has a limited market) and nickel oxide sinter (which both the government and industry prefer). The trend in production will be toward the latter product. National Lead operates this facility.

From Sulphur to Nickel—Freeport Sulphur Co., which owns the Nicaro ore body, is developing neighboring ores with financial help from the government. Explorations indicate a rosy future for this development if technical difficulties can be ironed out.

The picture, therefore, does look encouraging over the long pull. The immediate future is in doubt, and nickel could end up under government controls for a while. While this undoubtedly would be welcomed by some consumers that are having trouble getting the metal, it would be frowned upon by producers who felt the situation was getting better, especially regarding the government's attitude.

As one producer put it: "In a free economy, and with the danger of war decreasing almost daily, such a move would be ill timed and ill advised."

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Bldg., Cleveland 13, O.*



Tom M. Girdler

Ernest T. Weir

Charles R. Hook

Fairless Presents Three Gary Medals

Tom M. Girdler, chairman, Republic Steel Corp.; Charles R. Hook, chairman, Armco Steel Corp.; and Ernest T. Weir, chairman, National Steel Corp., were awarded Gary Memorial Medals at the American Iron & Steel Institute's meeting in New York.

Benjamin F. Fairless, newly elected president of the institute, presented gold medals to the three men, each of whom has served the iron and steel industry over 50 years.

The award is for outstanding achievement in the iron and steel industry. It was established in 1927 as a memorial to Elbert H. Gary, institute president from 1908 to 1927.

Citations: Mr. Girdler — outstanding as an engineer, organizer and executive. Mr. Hook—leadership in the fields of human and industrial relations. Mr. Weir—achievement in the development of a small steel operation into one of the nation's largest companies.

Mr. Fairless stated three medals were presented only after careful consideration of precedent. The recommendation is that the Gary medal be awarded only once in any one year.

Strengths, Weaknesses in the Economy

. . . as seen by National Industrial Conference Board's M. R. Gainsbrugh

STRENGTHS

1. **Major recessionary forces—unbalanced inventories, defense spending cutbacks, defense order cancellations—are gone.**
2. **Consumer spending is increasing.**
3. **Plateau and upturn has come in private investment.**
4. **Population pressures are boosting state and local government expenditures.**
5. **West Europe is booming. Exports at the beginning of 1955 were up 15 per cent over a year ago.**
6. **Further tax relief will be a sure bet in political 1956 if any soft spots show up in the economy.**

WEAKNESSES

1. **Production is bunching up. If both housing and auto output were to slide at the same time, look for trouble.**
2. **Credit is overextended.**
3. **Foreign competition is intensified.**
4. **The nation's sickest industry, agriculture, shows few signs of recovery.**
5. **Excessive wage increases could affect profit margins and reverse the pattern of private investment.**

Business Boom Sound, Say PAs

"BUSINESS in the second half of 1955 will be as good or better than it was the first half."

So predicted 75 per cent of the Business Survey Committee of the National Association of Purchasing Agents at its 40th annual convention in New York last week (see page 65).

Qualifications—Three most mentioned "Ifs" in the forecast:

1. Capital Expenditures. Industry's current expansion program is a strong stimulant to the economy. Any retrenchment might cause repercussions all along the line. But an earlier committee survey showed some companies expanding their programs; none was cutting back.

2. Consumer Spending. How long the current level of consumer buying and credit extension will continue is conjectural, the committee reported. Both are at current record levels; a serious drop will affect production and new orders.

3. Labor Situation. Prolonged strikes in the steel or auto industries could affect the nation's economy adversely.

The forecast follows on the heels of the banner business month of 1955. Over half the committee reported May production ahead of April's. So were new orders. Reemployment is at its highest level since 1950.

Optimism — Chester F. Ogden, survey committee chairman and manager of purchases at Detroit Edison Co., pointed out: "Purchasing agents are showing a willingness to lengthen their ordering time. Prices continue to edge upward, but are held in check by keen competition."

Supporting the purchasing agents' forecast were the professionals of the "Economic Problems" panel. Martin R. Gainsbrugh, National Industrial Conference Board Inc., outlined six elements of strength and five points of weakness in the economy.

Solid—Rapid recovery this year is all the more noteworthy, Mr. Gainsbrugh emphasized, because it did not stem from the "artificial" stimuli which sparked other recovery periods of the last 15 years — scare buying, shortages, increased government spending. "It came primarily through an upturn in consumer spending."

Significant, too, said the NICB economist, is that the $11-billion increase in personal consumption in the first quarter, 1955, over the peak 1953 period has not been primarily in hard goods, such as homes, autos and appliances.

Record—A softening in new-car production and sales—or consumer spending generally — in the next two or three months shouldn't be confused with a sustained cyclical downturn, Mr. Gainsbrugh pointed out. "Mild recovery patterns of the past suggest that by the end of this year gross national product ought to be about $380 billion—a record high."

A note of caution regarding prices and credit was injected by George A. Renard, executive secretary of the NAPA. He suggested a slowdown in credit to give people a chance to pay their debts and removal of stockpiling to bring prices into line, explaining: "Take away easy borrowing credit props and building materials will come off their perch. Take away stockpiling and the nonferrous metals will come closer to the general trend in price."

Do It Yourself—More than 2500 delegates to the convention learned how A. C. Gilbert Co. is saving $120,000 a year by changing metal specifications; how Carrier Corp. plans to save $200,000 through freight consolidation.

"Surprisingly few American businesses have devoted as much time and study to the purchasing problem as they have to controlling labor costs," said Hobart C. Ramsey, chairman of Worthington Corp. Yet the cost of materials and supplies often greatly exceeds the cost of labor. Purchasing, more and more, is being recognized not as a routine clerical process but "as a dynamic function essential to sound management."

Harris-Seybold Co.

As another $2 million in presses nears shipment . . .

Printing Equipment Sales Climb

"BASED ON GROWTH of the national economy alone, we figure that 1960 should see a total printing equipment market of about $350 million in the U. S. and Canada. In 1954, it was about $250 million; this year it should be around $275 million."

Growth—That's how Harris-Seybold Co., Cleveland, one of the largest printing equipment firms, sums up prospects for one of metalworking's oldest industries. Growing markets have expanded printing and publishing from a $3-billion business in 1928 to a $10-billion one last year, points out the Graphic Arts Association of Illinois.

The typical manufacturer has his own tool and die makers and the latest in precision machine tools. Excepting electrical equipment and castings, he makes most of his own components, primarily by machining metal.

GAM? — There's no guaranteed annual market in printing equipment. Competition among the eight principal American makers is keen. Because of low foreign labor costs, imports are an increasingly acute problem. About half the total equipment market is in presses; about one third of the remainder is in composing and typesetting machines.

Research is increasingly important in keeping equipment competitive. Since printers have high labor costs — their employees have the highest hourly average earnings of any major industry—machines that can do the job faster are in strong demand. In presses it's figured that there is a new machine cycle every seven to ten years. Spreading use of color in mass media and display advertising is having its effect in speeding up obsolescence.

New Look — Traditionally, printing equipment makers have been comparatively small, closely held companies. The complexity of the business makes it a tough nut to crack. No major new company has entered the ranks in the last 40 years and made a go of it. But today, no maker can afford to rest on his laurels. Makers of printing equipment are seeing the same round of expansions, mergers and diversifications as other industries.

Goss Printing Press Co. and Miehle Printing Press & Mfg. Co., both of Chicago, are enjoying expanded sales this year. Miehle reports business is up 10 per cent. Goss is in the midst of a two-year expansion in the magazine field.

Miller Printing Machinery Co., Pittsburgh, recently has realigned sales management to improve its attack on the industry's geographical centers in the New York and Chicago areas, which have roughly 30 per cent of total sales each. To help round out its products line, Harris-Seybold recently bought out the 100-year-old Cottrell Co.

Outlook—"The inevitable market growth must be balanced against the increase in competition," says one maker. "Progressive management must use all the modern tools."

Development of superior processing methods helps as . . .

Used Drum Sales Jump 20%

AFTER ONE TRIP, steel drums and barrels used to be turned into trash cans. Not now. For every new steel drum and barrel produced today about three are being reconditioned.

Reason — "Higher quality in drum reconditioning methods is resulting in a product more acceptable to the drum user, especially since this is coupled with greater economy," states Morris Hershon, president, National Barrel & Drum Association.

An "infant" in 1939, the reconditioning industry is here to stay. The Bureau of Census lists 250 independent reconditioner dealers and an additional 150 captive shops. Growth has been rapid since World War II when emphasis was placed on metal conservation. Add intense postwar business competition and rapid technological gains by reconditioners, and it is apparent why the potential market is expanding. Outlook for this year: Business is up some 20 per cent and should continue at this level.

Key to Success—P. A. Pearlman, president, Acme Barrel Co., Chicago, reports: "The high cost of new steel drums has forced consumers to seek a lower cost package. This is probably the uppermost reason for the increase in our business."

Example: Packaging costs can be reduced by averaging the price of a new drum with the lower cost of reconditioned drums over many trips. Frank Langella, president, Bayonne Barrel & Drum Co., says: "In this manner fillers (used drum customers) can save from 4 to 6 cents per gallon or more."

Area Survey—In the New York-New Jersey area prior to World War II, only 3000 units were reconditioned a day. This same sector now is reclaiming 18,000 steel drums and barrels a day. Why?

The answer rests largely with the development of new machinery that has increased efficiency and lowered unit cost. Machines straighten and seal chimes; an inside washer unit properly removes rust from the interior of bung-type drums; other machines permit automatic dedenting, testing and processing.

Another development—steel shot blasting — permits the interior of openhead drums and the exterior of all drums to be stripped to the raw steel.

A modern reconditioning plant is geared to recondition from two to three thousand drums a day. Each drum is automatically chime-sealed and straightened, stripped to the raw steel both inside and out, tested, dedented, coated with a high baked enamel and shipped ready for use.

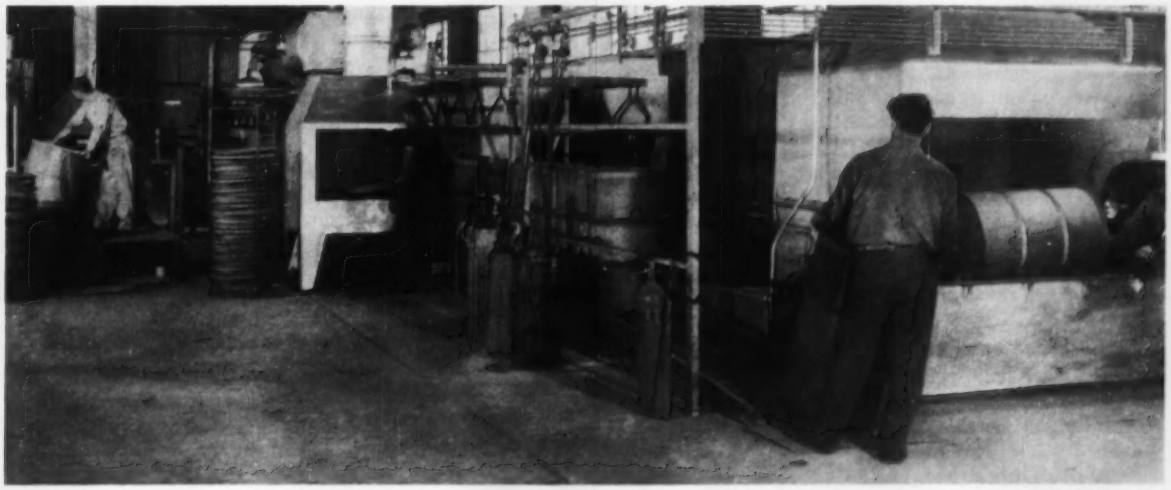
Potential—The future of the industry depends on two factors, quality and economy. For this reason, most reconditioners are spending freely on research which they feel will bring automation and new and better methods.

AF Policy Riles Planemakers

West coast plane and missile makers are fired up by Air Force Secretary Harold Talbott's statement that "any future reductions in aircraft and guided missile contracts will take place on the West and East Coast, rather than inland." The policy (not a new one) sent Los Angeles plane officials to Washington for clarification.

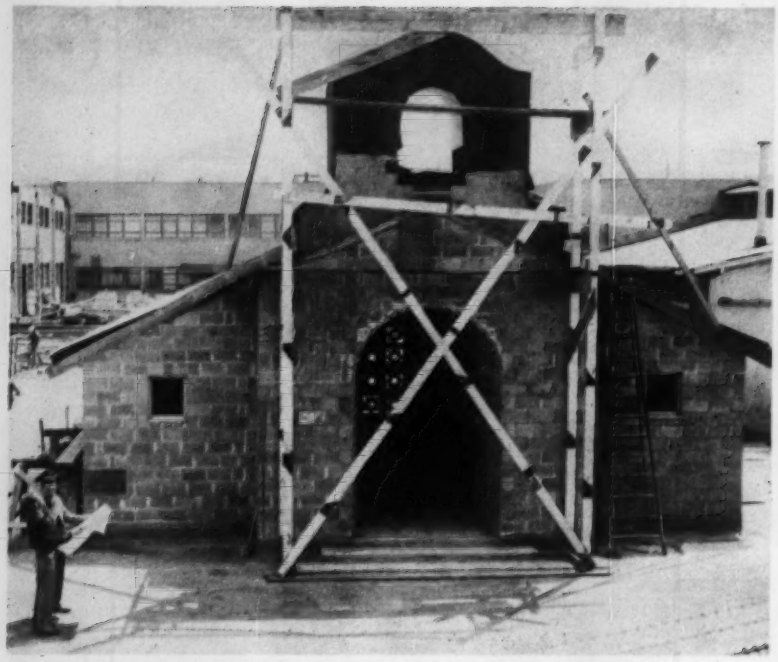
Lockheed Aircraft Corp. stopped work on its new Missile Division engineering building at Van Nuys, Calif., and warned engineering employees to await further moves. Mr. Talbott said earlier that he preferred to see Lockheed's military production maintained at the company's Georgia plant.

Mr. Talbott also warned Boeing Airplane Co. to move the "Bomarc" guided missile project out of Seattle "or we'll take it away." He said he informed Douglas Aircraft Co. to concentrate guided missile production in Tulsa, Okla., rather than in Santa Monica, Calif.



Bayonne Barrel & Drum Co.

New interior coating goes on used drums and covers



Company gives money, workers give labor to build . . .

Solar's All Faith Chapel

"I WOULD LIKE to see an interdenominational chapel, built here on company property, representing all the great religious faiths."

That was the beginning of Solar Aircraft Co.'s All Faith Chapel, which was dedicated on May 28. Edmund T. Price, Solar's president, hoped that at least 50 of his employees would support his idea, and that they would offer to build the chapel themselves in their spare time.

Faith—If you will do this, he pledged: "Solar will donate the space, the architect and the building materials." That was in November, 1952. Within the month, more than 100 employees offered help. Ground was broken the day before Christmas.

Since then, more than 400 have worked in teams on the building. Protestant, Catholic, Jewish, Hindu, Buddhist, Moslem and Bahai faiths have been represented. The completed chapel will hold some 100 people.

Planning—Vice Adm. Wilder D. Baker, USN ret., was appointed to co-ordinate the project. Employees elected a ten-member council to direct their part of the job.

Council members were Tipton Wood, training supervisor; Victor Alexander, machinist; W. Ross Konold, project planner; Duane J. Thornton, methods supervisor; Jean Wallace, secretary; Chris J. Rothstein, methods analyst; Bill Slinkard, project planner; Izadore Z. Rubin, scheduler; Stan Kochsmeier, journeyman welder; and Lew Anderson, foreman.

Participation—Groups from Solar's production and office divisions at the San Diego, Calif., plant have given their labor in turn on Saturdays, with 15 to 35 men and women on each team. The management club, made up of supervisors and foremen, also pitched in.

The chapel's future? Says Mr. Price: "That will be in the hands of the men and women who have built it, and those who may find in it a means of discovering and reaffirming universal spiritual values."

Steel: Stand-By Control Orders

To be ready for war or an unforeseen emergency, the steel industry soon may have "on-the-shelf" control orders. The Steel Task Committee of the Business & Defense Services Administration is planning to draft the proposed document which would be used only if necessary.

Due: More Steel Capacity

ODM is requesting industry estimates via BDSA. Decision on "how much" may come in July

HOW MUCH SHOULD steel capacity be increased? This question is being put before the steel ingot producers of the U. S. by the Business & Defense Services Administration.

By the end of June, BDSA hopes to have a complete roundup to present to the Office of Defense Mobilization.

Purpose—Besides growing civilian demand, ODM has two main reasons for eying an increase in steel capacity: 1. Military requirements are rising. 2. There is a possibility of loss due to bombing.

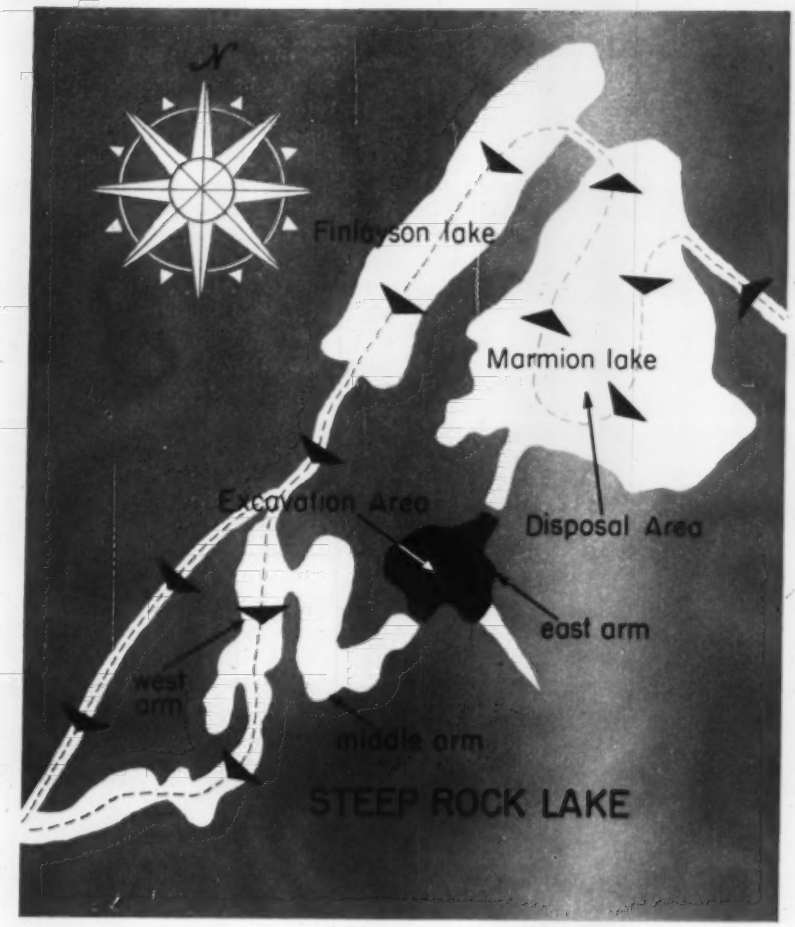
A hint as to what industry will reply was given last week during the 63rd general meeting of the American Iron & Steel Institute in New York. Arthur B. Homer, president, Bethlehem Steel Co., reported that he foresees an increase of some 4 million tons a year for the next 15 years.

Another Estimate—Upon his recent retirement as U. S. Steel Corp. chairman, Benjamin F. Fairless stated that if U. S. Steel was to retain its leadership, it would have to create the equivalent of a Fairless Works every two years for the next 20.

Washington "estimators" are predicting that ODM will recommend an immediate increase of about 9 million tons in annual ingot capacity.

Research Cost: $4.5 Billion

Research and development activities will cost the government about $2.4 billion this year. About $2.1 billion will be spent by private industry and nonprofit institutions. Of this amount, $20 million is spent by the Department of Defense for basic research. The Hoover Commission recommends a significant increase in this amount.



A giant dredging operation will relocate a lake as . . .

Inland Uncovers Iron Ore

SIX GIANT PUMPS spun into action last month for a grueling five-year night-and-day run. They will uncover a huge iron ore deposit beneath Falls bay in Steep Rock lake for Inland Steel Co.

Inland leased the 1200-acre tract in western Ontario from Steep Rock Iron Mines Ltd. after 250 diamond drilling tests showed at least 50 million tons of 53-per-cent iron ore lay beneath the bay.

Mission — The dredging operation, one of the largest of its kind ever undertaken, will remove about 150 ft of water, plus an estimated 160 million cubic yards of silt from the lake bottom. Full scale mining operations, both open pit and shaft, are scheduled for 1960. Output will be built up to 3 million or more tons of iron ore annually, says P. D. Block Jr., Inland vice president.

Biggest Problem — To start dredging, a basin large enough to hold the pumped off silt and water had to be found. Marmion lake to the northeast (see map) provided the answer, say officials of Construction Aggregates Corp., the Chicago firm in charge of dredging. By constructing three dams on the north to prevent silt from entering the Seine river, Marmion lake could act as the settling basin.

Water Needed—A water return had to be built from Marmion lake back to Falls bay because silt must be mixed with water to be pumped through pipe lines. This was done by making a rock cut on the west of Marmion and then channeling water back by gravity flow. Gilbert Roche, engineer in charge of dredging, estimates that the water of Falls bay will be pumped out and returned 12 times during the five-year period.

Pumping is done with two dredging systems. Each has a dredge with pump, a floating booster pumping station and a shore booster pumping unit. Each of the six pumps is powered by 10,000-hp electric motors; each has a capacity of 63,000 gallons per minute.

During dredging, the silt and water will be pumped a maximum distance of 5 miles and as high as 900 ft. Pipe lines are 42 in. in diameter and contain special steel liners for maximum life.

Background—Steep Rock lake's ore deposit became famous in 1942 when Cyrus Eaton, Cleveland steelman, arranged an RFC loan to form the Steep Rock Iron Mines Ltd., with Julian Cross and Joe Errington, Canadian mining experts. The lake is about 130 miles west of Port Arthur.

The Seine river formerly flowed through Marmion lake (see map) into Falls bay and Steep Rock lake. To permit dredging on the middle area of the lake where ore was first mined, the river had to be diverted into Findlayson lake and then into the west arm of Steep Rock lake and out to the south.

How Much? — Some of Steep Rock's most enthusiastic boosters claim deposits in the area are comparable to those of the Mesabi Range. More conservative estimates are pegging reserves at half a billion tons.

ODM: New Requirements Plan

A military requirements plan, agreed upon by the joint chiefs of staff, will become the planning base for the Office of Defense Mobilization.

ODM Director Arthur S. Flemming told a House appropriations subcommittee that the new requirements information relates to about 700 or 800 major items. This would account for about 70 per cent of the Defense department's expenditure for military hard goods. It is felt that this new plan also will have a major impact on the ODM strategic and critical materials list.

Ex-Im Bank Expands Exporter Credit

REPRESENTATIVES of foreign companies used to pound on the door of the Export-Import Bank of Washington. Their mission: To get enough financial backing to purchase American capital equipment.

Today, owing to a "buyers' market," it is the U. S. exporter who is turning to the "bank" for assistance.

How — Since November, 1954, the Export-Import Bank has been extending a line of credit to help exporters finance the sale of productive capital equipment and other services. Referred to as the exporter credit line, it actually does not give the individual exporter credit, but "earmarks" a designated amount which will be available for the exporter's qualified foreign clients on a case-by-case basis.

Before attempting to sell a foreign client, the exporter—if he has a credit line—will know what credit rating his customers must have, minimum cash requirements needed, the length time payments may run and what interest rates will be available.

Examples of recent exporter credit lines: 1. Butler Mfg. Co., Kansas City, Mo., $775,000 to help sell prefabricated metal building and other fabricated metal products. 2. Continental Copper and Steel Industries Inc., New York, $325,000 to promote the sale of earthmoving equipment and accessories. 3. Oliver Machinery Co., Grand Rapids, Mich., $130,000 to help finance its export sales of woodworking, metalworking and packaging machinery.

Requirements—The loans were granted on this basis: The exporter must receive a minimum cash payment of 20 per cent of the invoice value for each export sale; he also must participate by carrying not less than 25 per cent of the deferred payments. Under these conditions, the bank will guarantee "against default without recourse" up to 75 per cent of the deferred payment of each sale.

Do you qualify? The Export-Import Bank has a single questionnaire which tells you what information should be submitted in applying for an exporter credit line—and also answers questions.

Gear and Turbine Program?

■ As soon as the Defense Production Act is extended, the Gear and Turbine program should get under way. The administration has been slow in presenting its recommendation for extension of the act. Meanwhile, ODM feels that the Gear and Turbine program is a must to round out the production base.

AF: Jet Speed-Up

■ Air Secretary Harold E. Talbott has ordered a 35 per cent speed-up in B-52 production. This acceleration will permit the AF to complete the replacement of the B-36 in its heavy bombardment and strategic reconnaissance wings well ahead of schedule. Boeing Aircraft Co. will do the work at its Seattle, Wash., and Wichita, Kans., plants. There is no indication that additional B-52s will be ordered.

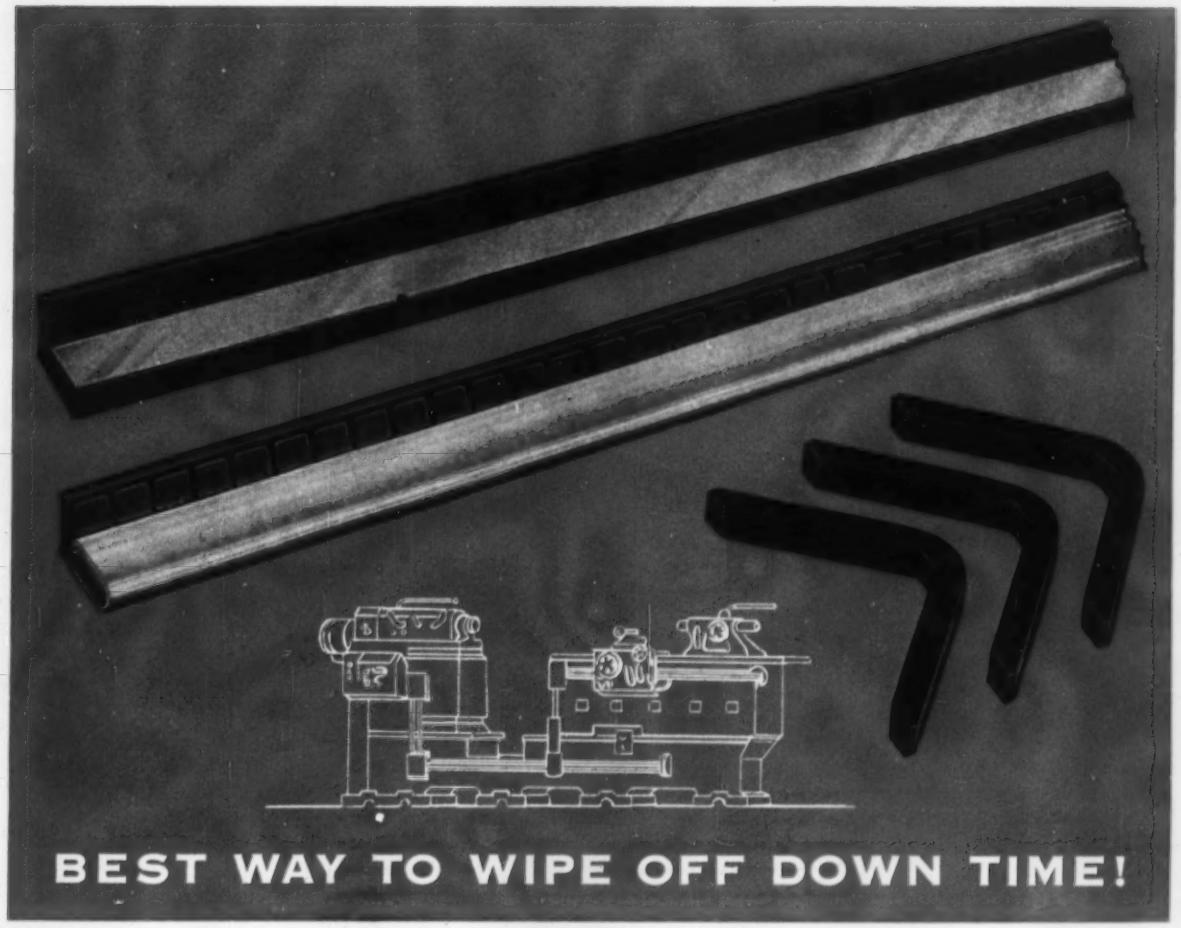
Informed Washington sources feel that this is the initial step in an over-all production increase for the entire AF jet program, with the exception of the jet transport plane.

Car Stocks Still Low

■ Note on cars: George H. Curtis, chief, passenger car branch, BDSA, reports that dealers still have less than a 30-day supply at current selling levels. "We also have the largest stock, by number count, that we have ever had," he states.

Meet Albert Polk: He is the new director of the Facilities, Distribution & Inventory Branch, Metalworking Equipment Division, Business & Defense Services Administration. His new duties will include tax amortization and idle inventory problems.

Mr. Polk is on leave from the Sheffield Corp., Dayton, O., where he is vice chairman of the board. He can be reached at the Department of Commerce, Sterling 3-9200, Ext. 3526.



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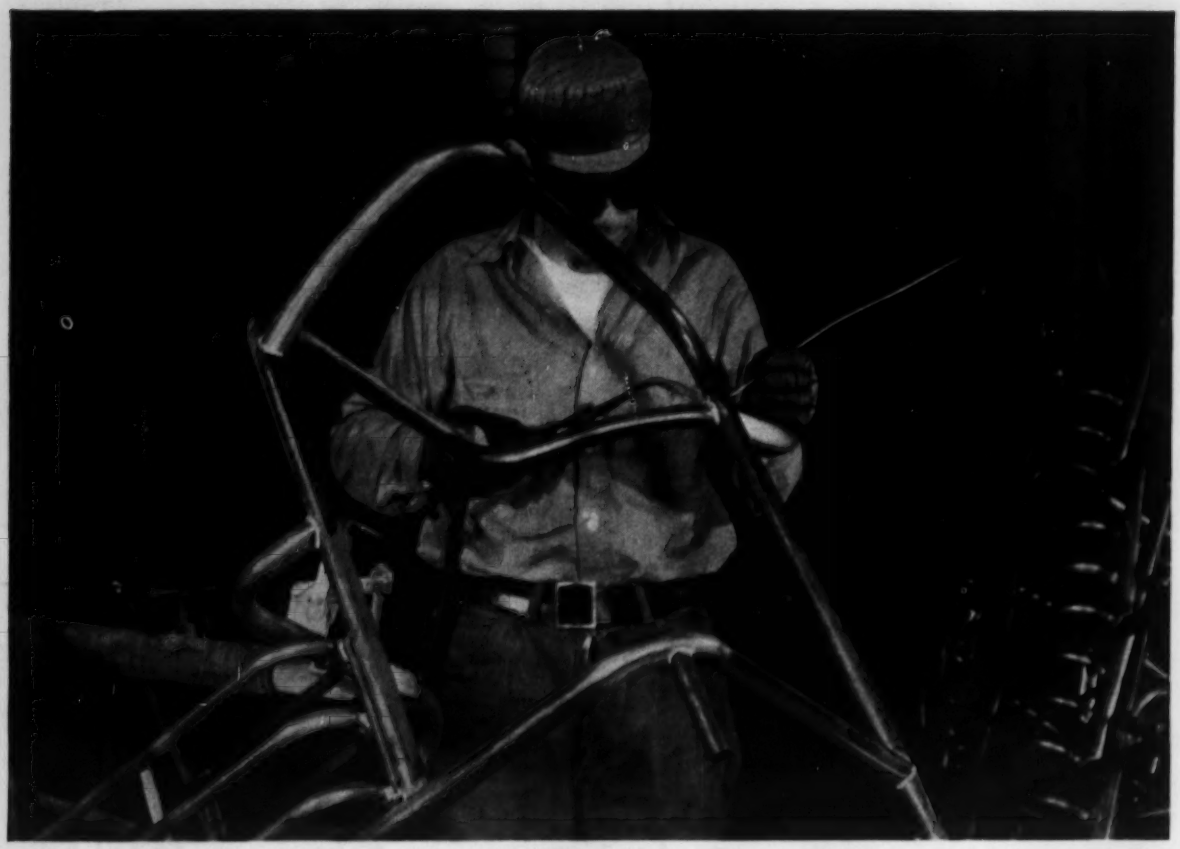

A revolving fixture holds this tubular steel chair-desk while the weldor brazes the joints with ANACONDA-997 (Low Fuming) Bronze Welding Rod. Heywood-Wakefield Company began producing welded steel tubing back in 1910. Today, they are leading manufacturers of tubular steel schoolroom furniture, bus, subway, railway car and theater seating.

here's production speed . . .

23 braze welds in 17 minutes

Here's the finished chair with seat, back rest and desk sections in place.

They know a lot about the techniques of production welding at Heywood-Wakefield Company, Gardner, Mass. Take the combination school chair-desk you see here. First it's tack-welded by semi-automatic resistance welding. Then it goes into a revolving fixture for braze welding with ANACONDA-997 (Low Fuming) Bronze Welding Rod and the flame-fluxed oxyacetylene process. The weldor swings the assembly to reach all joints from one position, completing the 23 welds in an average time of 17 minutes.

It's not only a fast job . . . it's a *good* job. The credit goes to Heywood-Wakefield engineers for their time-saving fixtures; to the weldor for his skill, and to the ANACONDA-997 rods he uses. Heywood-Wakefield prefers these rods because the finished welds are very strong, and they don't require special cleaning before painting. They're degreased, wire brushed . . . then painted. That's all.

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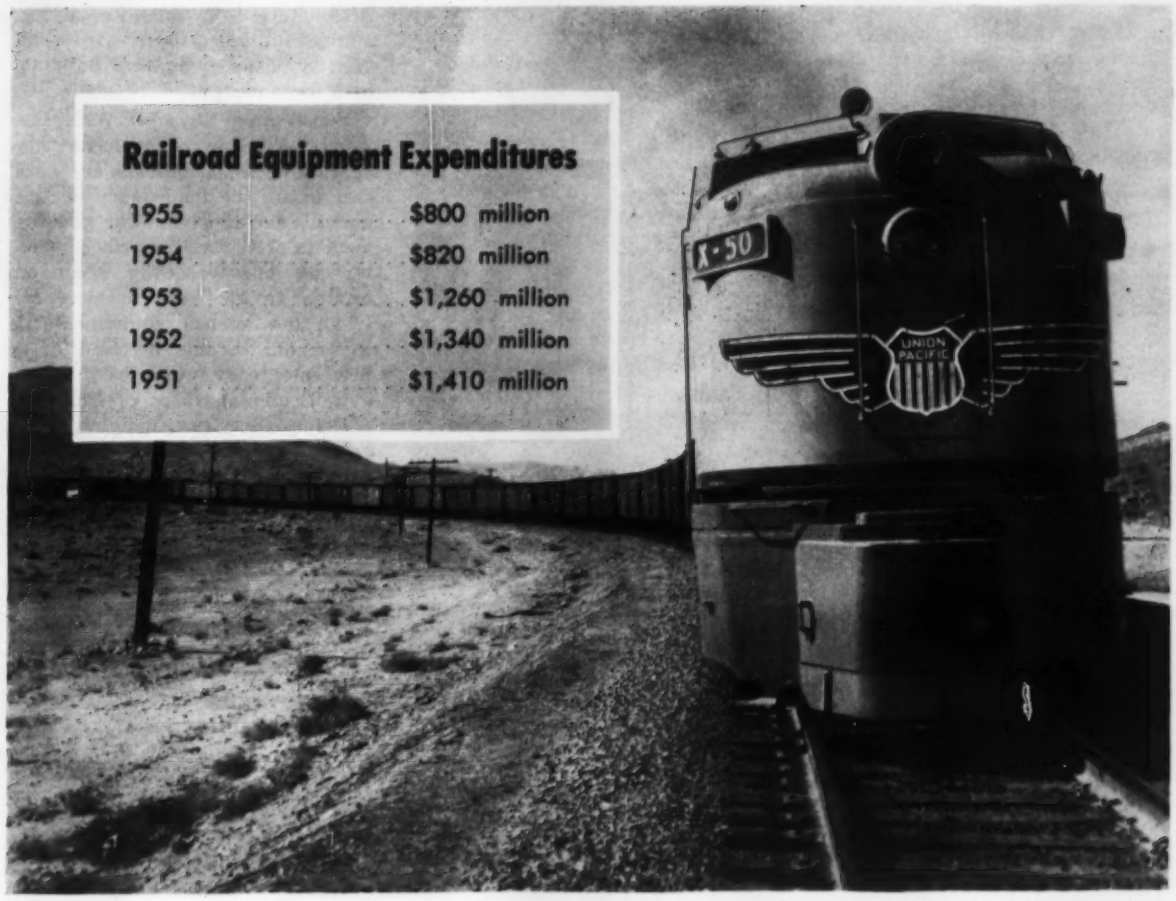


Railroads: Where Are They Going?

Record outlays for materials and supplies may offset lower capital equipment spending this year. Equipment buying spree is possible in 1956

RAILROADS are buying more than expected in 1955. Reasons: Better business, low inventories.

The upswing particularly is apparent in purchases of fuel, materials and supplies. Spending is running at $170 million to $200 million a month. If that rate continues, the year's total could hit $2.2 billion, an all-time high. In any case, this year will certainly pass up last year's low $1.4 billion and should exceed 1953's $1.9 billion.

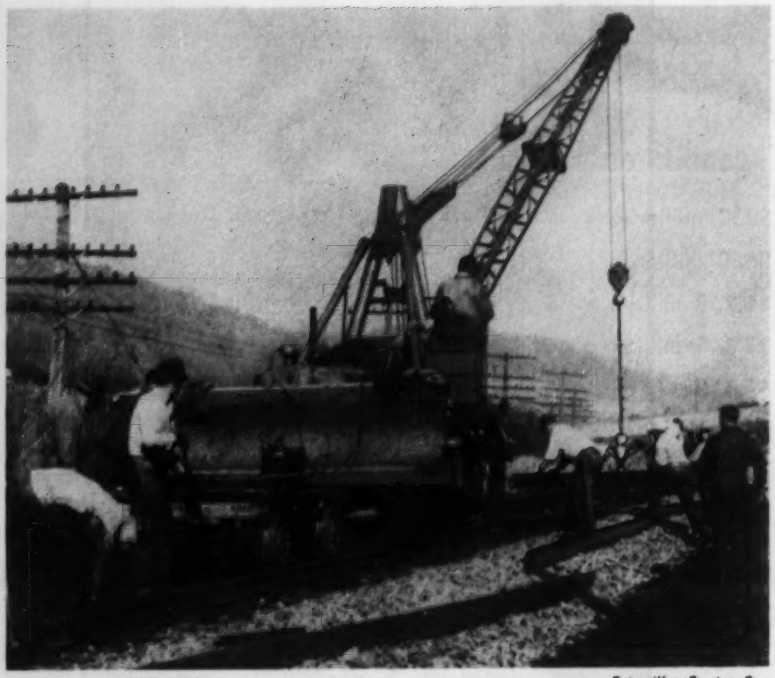
Promising Improvement — The equipment picture isn't quite so bright—but it's not so dark as it has been, either. Estimates supplied by 125 roads to the Interstate Commerce Commission early this year indicated that capital spending would fall 11 per cent behind 1954. Since then, the carriers have had such promising improvement in freight car loadings and earnings that predictions now are for spending almost equal to last year's.

One figure given is $800 million, 2.5 per cent under the $820 million spent in 1954. That's still considerably under the $1 billion or more spent each year from 1948-1953, though. One of the big reasons is that dieselization programs have passed their peaks.

Climbing Income—Pointing the way to better things in railroad buying, estimated net income of 126 Class I railroads for the first three months of this year was $175 million after interest and rentals. The same period in 1954 yielded $92 million.

Steel rails are another indicator of the pickup. Ordering was down; shipments of rails in the first quarter were 306,106 net tons, compared with 494,249 tons in the first quarter, 1954. Now the roads are trying to get tonnages larger than they originally ordered. They've also tried to get faster delivery.

Nothing Doing — Neither effort has been too successful. Over-all steel demand is so good that railmakers are unable to allocate more ingots to rails or to produce scheduled orders faster. Fortunately, curtailed rail-laying operations last year left some roads with substantial inventories of rails. That was against the trend of inventories of most railroad materials and supplies. Over - all, they



Caterpillar Tractor Co.

Proposals for further wage hikes and employee fringe benefits may skim the cream off savings resulting from modern maintenance equipment like this

dropped to $697 million from $831 million at the end of 1953.

If total railroad buying comes back even to 1953 levels, metalworking stands to pull in a sizable chunk of cash. About $406 million was spent for iron and steel products last year; $613 million in 1953.

What's Bought—Here's where it went: Track materials (such as rails, frogs, switches, track fastenings), $164 million last year, compared with $240 million in 1953; car forgings, iron and steel and fabricated or shaped steel for passenger and freight cars, $24 million vs. $33 million; locomotive and car castings, beams, couplers, frames and car roofs, $69 million vs. $89 million.

Another sign of better times for the railroads and their suppliers is freight car loadings, making a strong comeback after falling in 1954 to the lowest level in 16 years.

Loadings Jump—Through May 7, loadings of revenue freight were 7.1 per cent over last year's, but 7.2 per cent under 1953. That doesn't tell the whole story: In recent weeks loadings have been running 10 to 14 per cent over last year's. Chances are good for that trend to hold.

Skimpy car loadings removed the incentive to add to the freight car fleet. An additional deterrent was shrinking net earnings which made it undesirable for the railroads to take on additional big debt by financing new equipment.

Even deferral of taxes through fast tax write-off became less attractive because carriers expected below-normal taxable income anyway.

Building Comes Back — The freight car ownership expansion program inaugurated at the start of the Korean War was temporarily shelved in 1954 as equipment needs were re-examined in the light of lower economic activity and a further reduction in the railroads' share of intercity freight traffic. Only 28,405 new freight cars were placed in service last year by Class I roads, the smallest annual total since 1939.

Now, higher income and rising freight car loadings have stimulated a resumption of new car buying on a promising scale. Orders in the first quarter were 12,639 cars. Only 5902 were ordered in the first four months of 1954 and just 23,313 in the full year. Estimates put building this year at between 30,000 and 40,000 cars. Also notable is increased repairing and rebuilding of older cars—that activity outpaces new car building by a large margin.

Washington Says — With the rapid expansion of business this year, government officials are worried about the inadequacy of the nation's car supply. "The government is pretty well convinced that we are now critically short of enough freight cars to meet civilian and defense requirements if we should become involved in a new emergency," Charles F. Honeywell, administrator of Business & Defense Services Administration, told the annual convention of the Purchasing & Stores Division of the Association of American Railroads.

Mr. Honeywell said BDSA will recommend ways of financing needed car building to the Office of Defense Mobilization. An ODM committee is now studying the problem. If it confirms the car shortage, BDSA also will determine the country's freight car productive capacity including plants, materials and components.

New Ideas—The future already is a little better for locomotives. At the end of March there were 428 new locomotive units on order, compared with 365 at the same time a year earlier. On the other hand, Class I railroads installed 306 new units in service in the first quarter, against 421 in the same 1954 period.

To increase revenues the roads are trying out some new tricks. Piggyback is one. The idea had been working in some areas for a number of years, but when it first got serious promotion a few years ago, prospects were anything but bright. Now piggyback is growing fast. Railroads are investing in special flat cars and loading equipment to improve and expand the service. More spending for this equipment is ahead.

New Look—There is a revival in passenger equipment, too. Many railroads find passenger traffic a losing venture and refuse to spend much money for new and improved equipment. But several roads have taken a new look, and there is a fair amount of new passenger car buying.

Lightweight, high speed trains, combining lower first cost and eco-

nomical operation, are winning support. About a half dozen such trains are on order. Delivery is still some time away.

Rate Plea — Railroads continue to operate under handicaps in their efforts to compete with other kinds of transportation. No sudden reversal of this is in sight.

Some progress is being made. Railroads recently asked the ICC to make permanent the temporary 12-to-15-per-cent freight rate increases granted three years ago. The hikes are due to expire at the end of the year. The petition states: "Operating results in 1954, a year of mild recession, showed an even greater financial need (for the higher rates) than when the increases were authorized in April, 1952." ICC promises prompt action on the rate plea.

Committee Report — Encouraging to the roads was the Eisenhower administration's release in April of the long delayed Transportation Report of a cabinet committee headed by Commerce Secretary Sinclair Weeks. One of the provisions would strip ICC of much of its power to fix rail freight rates, another would give federal financial aid for research designed to improve railroad equipment.

A chief effect of the panel's recommendations, if adopted, would be to allow the financially hard pressed railroad industry to compete better with other transportation. The report faces rough going in Congress.

Looking Ahead—In any case, the future of railroads is looking brighter. Eliot Janeway, author-economist, told the Western Railroad Club in Chicago that 1956 will be a banner year for railroads. He said the railroads' ability and need to buy reflects heightened railroad traffic, which, in turn, reflects heavy industry activity.

"Next year will see the railroads worrying about where the equipment to service traffic is coming from, not where the traffic is coming from," is what Mr. Janeway predicts.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Bldg., Cleveland 13, O.*

"A RAILROAD RENAISSANCE, particularly in equipment and track tools, is bringing dramatic changes in the nation's rail carriers."

So says Paul W. Johnston, president of the Erie, which last year completed its dieselization program, the first major New York-to-Chicago road to do so.

Below the Surface—Dieselization is the most obvious sign of rebirth, points out Mr. Johnston, but there are many others—special flat cars for piggybacking or open-top cars to handle coil steel, many different kinds of specialty boxcars, various types of covered hoppers, air-flow cars for handling flour, new kinds of refrigeration cars, mechanized track maintenance equipment and modernized shop facilities.

"And still more changes are coming," says the Erie's president, "which are only a gleam in our eyes now." He sees as "possible" another revolution in motive power as drastic as dieselization was. It might be brought by the turbine, perhaps by the atom.

Changing—"Obsolescence is an increasingly important factor in railroad equipment planning," he says. "And that's encouraging, not alarming, because it will mean lower maintenance and operating costs." He points to Erie's dieselization to prove his point. The $75-million program originally was planned to be completed by 1960, to make more gradual the obsolescence of steam locomotives. But cost savings were so marked (20 to 30 per cent over steam) that the program was speeded.

About $12 million will be spent in 1955 by the Erie on equipment, maintenance and track repair. Plans include 500 new all-steel boxcars, ordered recently at a cost of nearly $5 million.

Erie Story—Paul Johnston has been an Erie man all his adult life. Time out from the road has come only for education and a stint of Army service during World War II. He served in the South Pacific with Gen. Douglas MacArthur as a brigadier general. In 1949, he became president of the company.

His first regular job with the Erie after being graduated from Allegheny College was station supervisor 37 years ago. In his progress up the ladder, he and his family moved to various cities along the Erie 21 times in 17 years.

Maybe that's why he says: "Railroads can't stand still. We're on the move for a renaissance in transportation."

PRODUCTION PROBLEM?

if you use flat-rolled steel talk to a specialist

PROBLEM With present designs and manufacturing facilities, the auto industry needs wide coils of sheet steel with a minimum number of welds. These welds must be cut out before steel goes into the big presses—a costly, time-consuming process.

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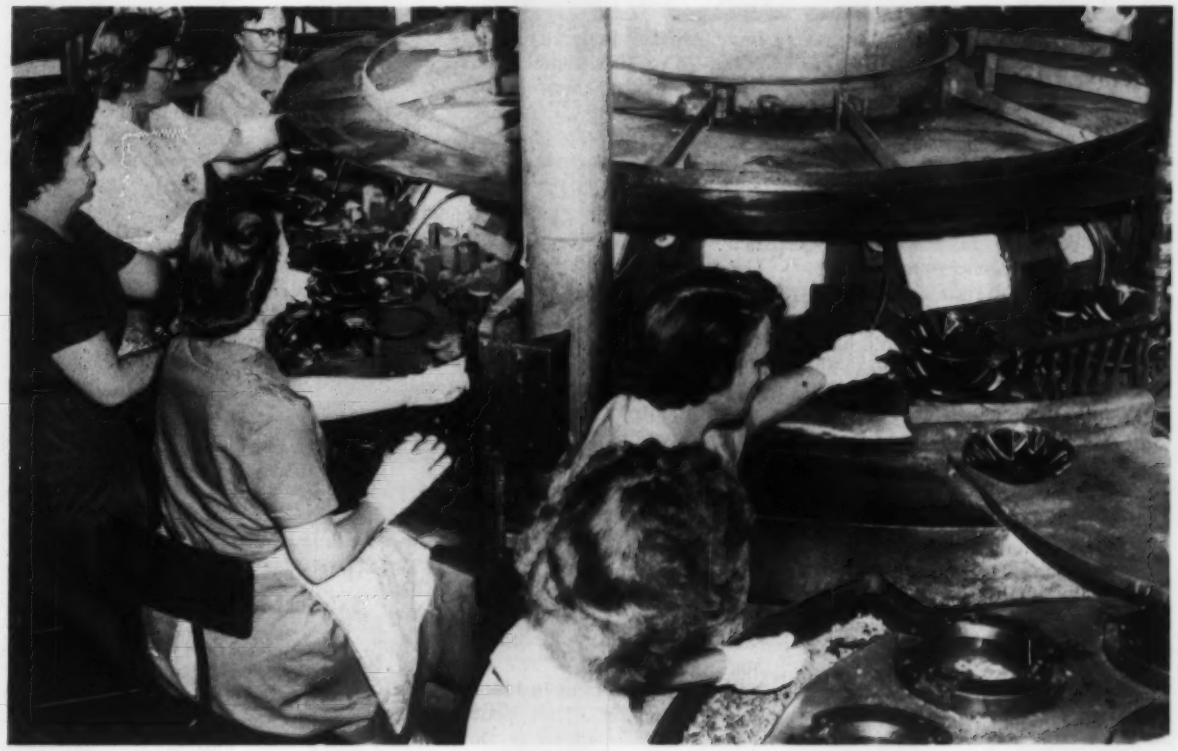

Guide Lamp's merry-go-round turns out headlamps for . . .

Throwing Light on Autos

FROM A repairer of acetylene carriage lamps with $300 capital to the world's largest vehicle lamp manufacturer—that's the history of General Motors Corp.'s Guide Lamp Division.

Started in Cleveland — In October, 1906, three men who had been working for a carriage lamp manufacturer formed their own company in Cleveland. At the time that city was the home of the Royal, Winton and Stearns cars and the center of the automobile accessory trade. From repairing acetylene lamps, the three began to think about manufacturing lamps. In 1908, assisted by T. A. Willard, the battery man, they produced and marketed the first electric headlamp for motor vehicles.

Quantity orders came from Rauch & Lang Electric Carriage Co. and Baker Electric Co. In 1913 the Guide Motor Lamp Mfg. Co. was formed. Its first gasoline automobile contract was for 500 sets of headlights, batteries, switches and wiring for Glide Automobile Co. Soon Reo, Chandler, Peerless and Haynes cars were Guide-lamp equipped.

Expansion—By 1920 more room was needed and a modern factory building was erected in Cleveland on W. 110th street. It included a modern engineering department. In 1922, the Guide Ray headlamp was developed by C. A. Michel, present head of Guide. This lamp, because of its optical design, proved a real dazzler, and two years later the Tilt Ray headlamp was introduced by Guide. Developed by the company's present chief engineer, R. N. Falge, it incorporated a bulb having two filaments.

To compensate for variations in filament location in the bulb, engineers developed an entirely new reflector and lens. The former was bifocal in design, so that only a single horizontal focusing was necessary. The superiority of the design resulted in orders that engulfed the modest capacity of the company. As a consequence, Guide licensed all its competitors to build the lamp under Guide patents, and it continued as standard equipment on a number of cars for years.

GM Comes In—Meanwhile, General Motors gave its Delco-Remy Division in Anderson, Ind., a chance to produce one-half the Chevrolet lamp requirements in 1927. As the firm's interest in lamps grew, attention focused on the most successful manufacturer of automotive lighting equipment—Guide. Negotiations led to Guide being merged with Delco-Remy in August, 1928, as part of General Motors. On Jan. 1, 1929, Guide Lamp's ties with Delco-Remy were broken and Guide became a separate division of General Motors.

The limited lamp activity of Del-

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co-Remy was added to the greater lamp manufacturing facilities of Guide and soon the division was supplying lamps for all GM cars and trucks, adding this volume to the business already on its books. A new building which increased manufacturing capacity made it possible to close the Cleveland plant in 1930 and concentrate activities in Anderson.

War Work — Employment was about 1250 persons. Operations included forming, finishing and assembling sheet metal parts. You will recall that at that time a headlamp was something fastened onto the car instead of being housed in a hole in the fender. Deep drawing was one of the major talents of Guide. This talent made it a natural for manufacturing shell cases during World War II.

Guide has broadened its philosophy to include "seeing whether by day or by night," says General Manager C. A. Michel in explaining the division's greatly diversified products. They include rear view mirrors, traffic light viewers, spotlamps, back-up lamps, fog lamps, plastic reflex reflectors and the Autronic eye. To manufacture these products, operations at Guide have been expanded to include zinc-base diecasting, plastic molding, cold heading, glass grinding, heat treating, vacuum metallizing and improved metal finishing.

Guide is extensively into each of these fabricating areas. It pours about 4 million lb of zinc-base diecasting metal annually, vacuum metallizes about 30,000 sealed beam lamp reflectors daily and keeps about 22 plating installations going full blast. Take a chromed part like the Buick tail lamp, for example. Guide turns out about 9000 a day.

Facelifting — Guide gets a full model change every year. Facelifts of cars hang heavily on the lamp treatment, and that means Guide must take the shape the stylists have come up with, engineer optical properties into the unit and build the fixtures to process and assemble it while maintaining production schedules of units still in production.

The use of fixtures carefully tailored to these transitory parts might prove somewhat surprising. However, experience has shown that the higher output possible justifies their use rather than multipurpose fixtures which might have greater longevity. There are about 25 or 30 assembly conveyors in the plant, each 50 ft or so in length, depending on the size of the part and number of operations.

Big Volume — Assembly starts with the main shell nested into the fixture and other parts are then added in sequence as dictated by the design of the particular unit. Bins of assemblies and subassemblies in combination with pneumatic screw drivers permit the production of most units from a single assembly line despite the high volumes required. About 40 million automotive lighting units and accessories flow from lines yearly.

One of the best known is the sealed beam headlamp which as manufactured by Guide incorporates a bulb and metal reflector rather than an all-glass unit. The procedure of manufacture for the 30,000 units daily includes stamping and piercing of the reflector, followed by dipping in black enamel and baking. This provides a glossy surface which is aluminum coated by the vacuum metallizing process in 17 pairs of chambers containing 13 units each. It is estimated that 20,000 reflectors can be coated with 1 lb of aluminum.

Automaticity — The reflectors next go to a machine on which the bulb is positioned in focus by actual filament image and soldered in position by women who operate the automatic focus and soldering machine (see photo). A thermoplastic gasket is then placed around the rim of the reflector and the glass lens positioned. An oven heats the gasket forming a seal and the edges are then crimped to complete the unit.

But in addition to the high-volume parts like the sealed beam units, Guide also makes many smaller-run products. R. M. Wagner, general superintendent of production, estimates that the production schedule most months will include about 1500 different types of lamps, with some containing as many as 90 different parts. Guide makes about 120 different spotlamps alone.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994†	676,269
May	870,000*	621,262
June		623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,885,010

Week Ended	1955	1954
Apr. 30	231,021	159,206
May 7	215,756	154,640
May 14	221,746	153,796
May 21	221,936	157,993
May 28	209,854†	148,733
June 4	215,000*	119,688

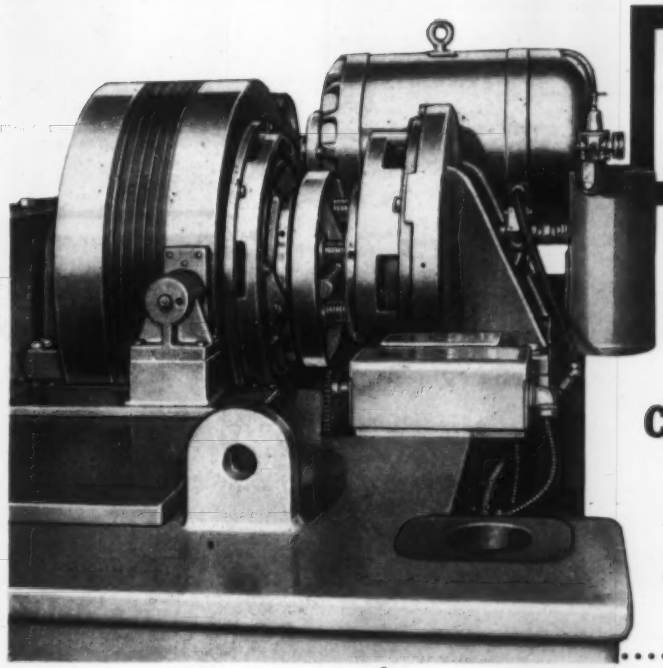
Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Exhaust Notes

Production continues its dizzy pace in the Motor City, with the first third of the year an alltime record. Ford completed its 1 millionth 1955 unit on May 27. News releases of production records are keeping statisticians as busy as a world series. But one word of caution: Watch for a slowdown during the third quarter as dealers begin to pare inventories for model changeover and spring demand wanes. Falloff should be relatively sharp as an 8.5-million unit production pace adjusts to a 6.5-million market, despite new model introductions earlier this year than in 1954.

American Motors is doubling its original production schedule for the Metropolitan 85-in. wheelbase Austin import. This brings to 40,000 the number of units ordered since the car was introduced last year. It accounted for 18.5 per cent of all foreign car registrations in 1954, though it was not introduced until March.

The auto industry, viewing its future as a traffic jam, is pushing harder for improved highways. Latest statement by Automobile Manufacturers' Association President James J. Nance calls for a $27-billion highway expansion program over the next ten years to prevent deficiency now costing $5.3 billion annually.



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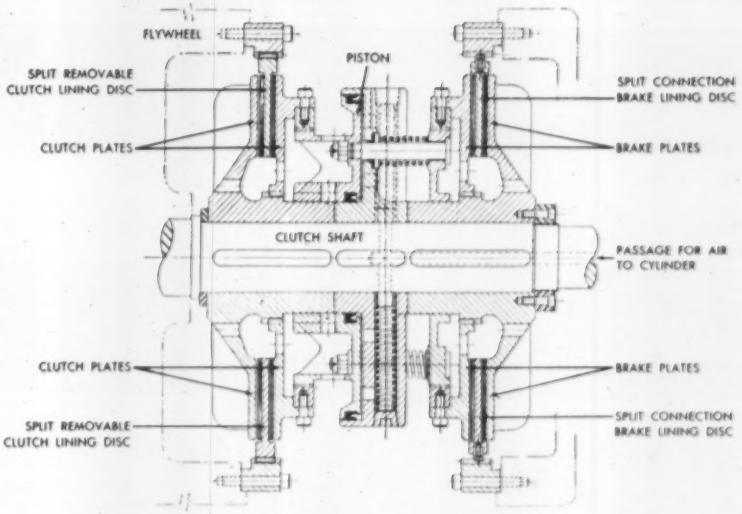
To engage the clutch, air is admitted to the operating cylinder through a passage in the drive shaft. This forces the piston out, compressing the brake springs and releasing the brake. Further motion of the piston engages the clutch thereby transmitting the motion of the flywheel to the clutch shaft.

When air pressure in the operating cylinder is released, the brake springs pull the piston back, first disengaging the clutch and then engaging the brake.



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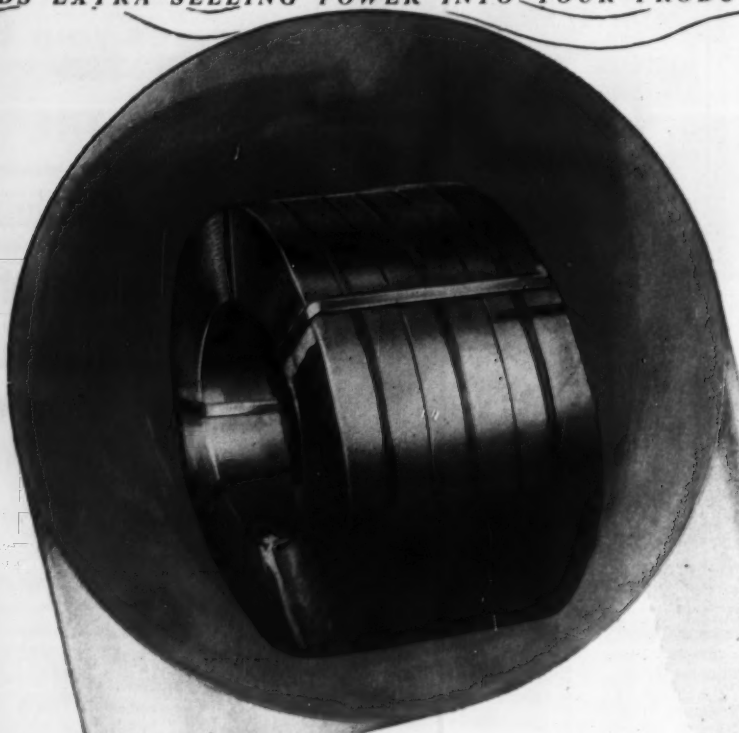

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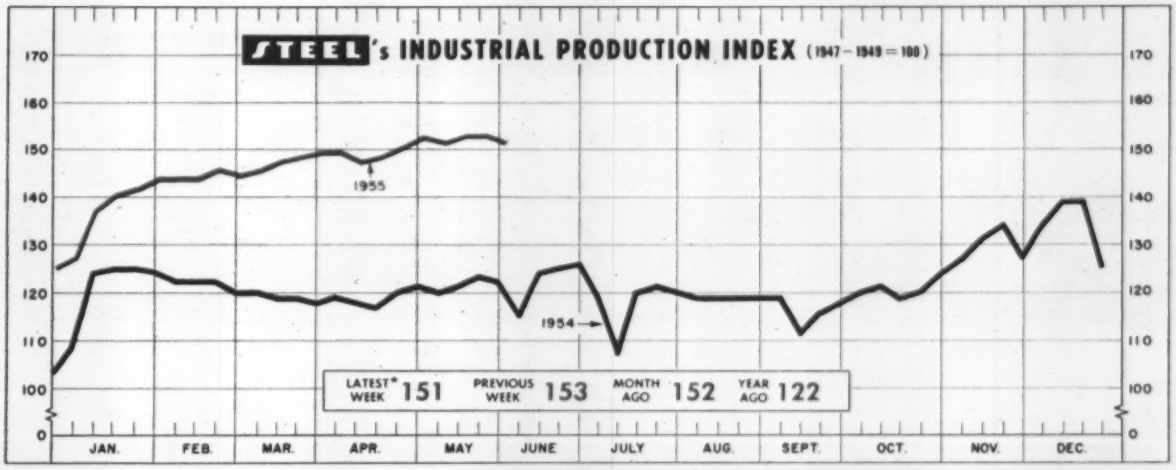

*Week ended May 28. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

Purchasing Agents Look Ahead with Confidence

"BETTER BUSINESS in the second half," say one-third of respondents to the latest monthly survey of the National Association of Purchasing Agents.

Optimism is even more widespread than that figure indicates. Another 42 per cent of the PAs expect business to hold about the same as it was in the first half. That's in marked contrast to the feeling of not long ago when businessmen were doubtful about second-half prospects.

Breather—Many feared a sharp fall-off in business. Now, even the 25 per cent of the PAs who see lower business ahead aren't looking for a major cutback. Rather, they term it a breathing spell coming largely because of the third-quarter vacation period and possible slackening of auto sales owing to model changes and high first-half output.

Stability is another facet of the PAs thinking. This year there will be no rapid changes in production levels from third to fourth quarter as there were last year.

Agreement—On this item there's general agreement: Second half, 1955, will be substantially better than second half, 1954. Four-fifths of the PAs predict it; only 4 per cent think it will be poorer.

The auto industry is the one fly in an otherwise clear soup. General feeling is that the extent of strikes and the level of auto sales may be the key to future business conditions.

Gains—Good business in May is undoubtedly one of the reasons for the PAs' optimism. Production was high, with 52 per cent reporting an increase over April. The 5 per cent whose output was lower said it was only slightly so.

New orders continue good. For the fourth straight month, over half the PAs report an increase over the previous month.

Inventories are going up, with 32 per cent noting additions. The 19 per cent having lower stocks is the smallest number since July, 1950. Large scale inventory build-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,334	2,326	1,674
Electric Power Distributed (million kw-hr)	9,650[1]	9,730	8,433
Bitum. Coal Output (1000 tons)	9,260	8,920	7,202
Petroleum Production (daily avg—1000 bbl)	6,680[1]	6,676	6,431
Construction Volume (*ENR*—millions)	$402.7	$475.7	$288.5
Automobile, Truck Output (*Ward's*—units)	209,854	221,936	148,733
TRADE			
Freight Car Loadings (1000 cars)	760[1]	774	689
Business Failures (Dun & Bradstreet, no.)	220[1]	226	248
Currency in Circulation (millions)[3]	$29,826	$29,877	$29,697
Dept. Stores Sales (changes from year ago)[3]	+8%	+11%	−5%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,337	$21,772	$18,517
Federal Gross Debt (billions)	$277.4	$277.3	$273.2
Bond Volume, NYSE (millions)	$18,052	$18,123	$14,574
Stocks Sales, NYSE (thousands of shares)	10,140	10,690	10,278
Loans and Investments (billions)[4]	$84.5	$84.2	$80.5
U. S. Govt. Obligations Held (billions)[4]	$33.6	$33.4	$33.0
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.75
STEEL's Nonferrous Metal Price Index[6]	237.2	237.1	213.2
All Commodities[7]	110.3	110.3	111.0
Commodities Other than Farm & Foods[7]	115.7	115.7	114.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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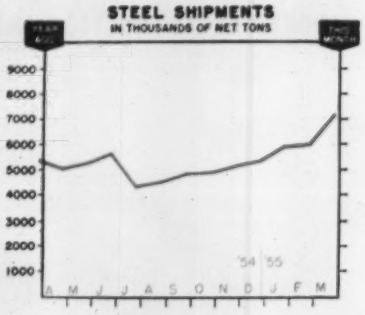
THE BUSINESS TREND

STEEL SHIPMENTS
IN THOUSANDS OF NET TONS



	Net Tons 1955	1954	1953
Jan.	6,009,958	5,727,600	7,067,636
Feb.	6,119,900	5,364,978	6,533,227
Mar.	7,268,795	5,583,690	7,436,919
Apr.	...	5,287,972	7,162,460
May	...	5,423,168	7,209,396
June	...	5,887,488	6,950,059
July	...	4,490,179	6,582,513
Aug.	...	4,681,242	6,498,605
Sept.	...	5,004,222	6,400,757
Oct.	...	5,035,364	6,726,850
Nov.	...	5,240,209	5,903,980
Dec.	...	5,448,649	5,684,920

American Iron & Steel Institute.
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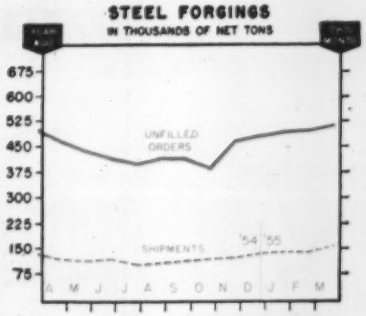
STEEL FORGINGS
IN THOUSANDS OF NET TONS



	Shipments 1955	1954	Unfilled Orders 1955	1954
Jan.	136	139	488	638
Feb.	135	127	492	539
Mar.	154	130	507	487
Apr.	...	116	...	460
May	...	107	...	431
June	...	113	...	409
July	...	97	...	396
Aug.	...	102	...	410
Sept.	...	109	...	409
Oct.	...	113	...	382
Nov.	...	120	...	461
Dec.	...	129	...	473

U. S. Bureau of the Census. Data based on reports from commercial and captive forge plants with monthly shipments of 50 tons or more.

ing hasn't happened, and isn't likely to. Most increases are to take care of higher production schedules. Buying policies, except for capital equipment, are holding within a 90-day range on most items.

The employment picture is best since mid-1950. Only 4 per cent say employment dropped during the month. In some areas demand for skilled production help and good clerical workers continues to exceed supply.

Building: Still Going Up . . .

Construction is still building new records. It's now a full 20 per cent above the previous high (1953) for the first 21 weeks of a year. And where she stops—or even slows down for that matter—nobody knows.

Contract volume in the last five weeks has averaged $437 million, says *Engineering News-Record*, up sharply from the record $335-million weekly average of the preceding 16 weeks. Awards for the year to date are $7.5 billion.

Where's it going? Housing projects account for about a third of the total. The rest is divided among industrial and commercial building and federal, state and local government projects, including roads, waterways and other public works.

Solid Foundation . . .

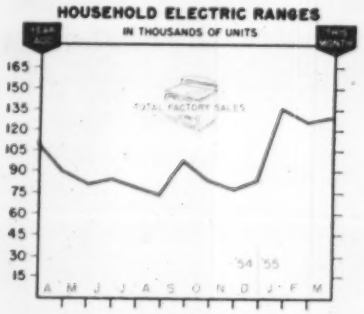
One of the most encouraging aspects of the construction boom is its diversity of type and location. Here are a few samples of large contracts awarded in recent weeks:

A highway and bridge project in Massachusetts, a power plant in New York, a shopping center and apartments in Philadelphia, an atomic power plant in Illinois, two reservoirs in Colorado, an auto parts plant in Ohio, a dam in Montana, a residential development in Indianapolis: They add up to continuing good times for construction and for metalworking firms selling in that field.

Structural Backlogs Rise . . .

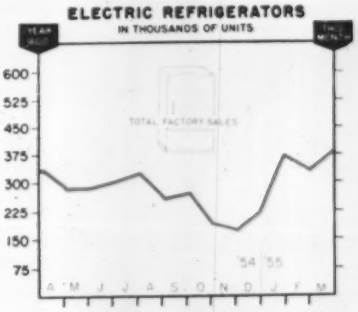
One branch of metalworking receiving direct benefit from the construction rampage is fabricated structural steel. The American Institute of Steel Construction puts unfilled orders at 1,443,506 tons as of Apr. 30—the largest backlog since last May and 10 per cent over the August, 1954, low.

April shipments were 239,658



Total Factory Sales—Units	1955	1954	1953
Jan.	136,663	101,870	88,145
Feb.	127,188	109,647	114,465
Mar.	130,180	115,393	130,788
Apr.	.....	92,751	118,999
May	.....	82,649	114,404
June	.....	85,854	113,086
July	.....	80,017	77,836
Aug.	.....	75,907	74,326
Sept.	.....	99,611	84,481
Oct.	.....	84,321	73,422
Nov.	.....	79,340	55,748
Dec.	.....	85,033	73,870
Total	.....	1,092,393	1,119,570

National Electrical Mfrs. Assn.



Total Factory Sales—Units	1955	1954	1953
Jan.	381,197	344,401	325,186
Feb.	338,575	334,122	377,606
Mar.	392,774	330,641	368,498
Apr.	.....	280,900	366,951
May	.....	282,164	317,667
June	.....	303,127	343,114
July	.....	325,061	298,838
Aug.	.....	256,665	232,981
Sept.	.....	271,859	231,224
Oct.	.....	190,753	179,749
Nov.	.....	175,557	139,563
Dec.	.....	228,612	197,102
Total	.....	3,323,562	3,378,478

National Electrical Mfrs. Assn.

tons, highest monthly total of this year. For the year to date, though, shipments lag behind last year's tonnage. Bookings were below March's 22-month high, but were still 46 per cent better than were recorded in April, 1954.

Metalworking Sales Gain . . .

Metalworking bellwethers show continuing improvement. April gear sales were best since December, second best since October, 1953. The American Gear Manufacturers Association reports the April sales index at 179.8 (1947-1949 = 100). The 1954 low was 116.7 in November.

The Foundry Equipment Manufacturers Association puts April equipment orders at 178.6 per cent of the 1947-1949 average. It was the best month since May, 1953, and more than equaled January and February (1955) combined.

The Resistance Welder Manufacturers' Association says new orders in the first four months are up 10 per cent over the same 1954 period. Shipments are 29 per cent higher.

Industrial heating equipment in particular is soaring ahead of last year. Business in April was 119 per cent over that month of last year, reports Industrial Heating Equipment Association. For the first four months, business is 79 per cent ahead of 1954. April orders were $7.7 million.

Factories Do More Hiring . . .

For four months in a row (through April), the number of factory workers hired was greater than the number who left the rolls. It's a good sign for employment, being only the second April since World War II that hirings have exceeded total separations, reports the Labor department.

More plentiful jobs are having an effect on the workers, too: The quit rate is up. That usually happens only when workers are confident that they can find a new job easily. Also important, if workers feel sure they can find new jobs, they are more likely to spend more of their pay checks, save less for a rainy day.

Pay checks, though, were a little smaller in April than they were in March. A shorter work week was the reason. It wasn't much of a slide but enough to bring the average weekly take-home pay of workers down 40 cents from March's all-time peak. Compared with a year ago, though, take-home pay is up 6 per cent, or $3.60 a week.

• Edited by GEORGE BLACK

VALVE TECHNICAL DATA

A preprint of the technical data section of the forthcoming COOPER ALLOY Valve and Fitting Catalog is available on request. It contains diagrams, design data, cutaway photos, selection, maintenance and repair hints and information on special types and operating mechanisms. Please ask for VALVE TECHNICAL DATA.

DEPENDABLE PUMPING IS KEY

The key to the successful operation of an oxygen analyzer designed for the continuous measurement of oxygen in gaseous streams is the dependability of the Vanton polyethylene pump with neoprene "flex-i-liner" which pumps cuprous ammonium chloride 24 hours a day, 7 days a week, with complete assurance against corrosion or contamination. Full story on request.

RESEARCH UNVEILS NEW ALLOYS

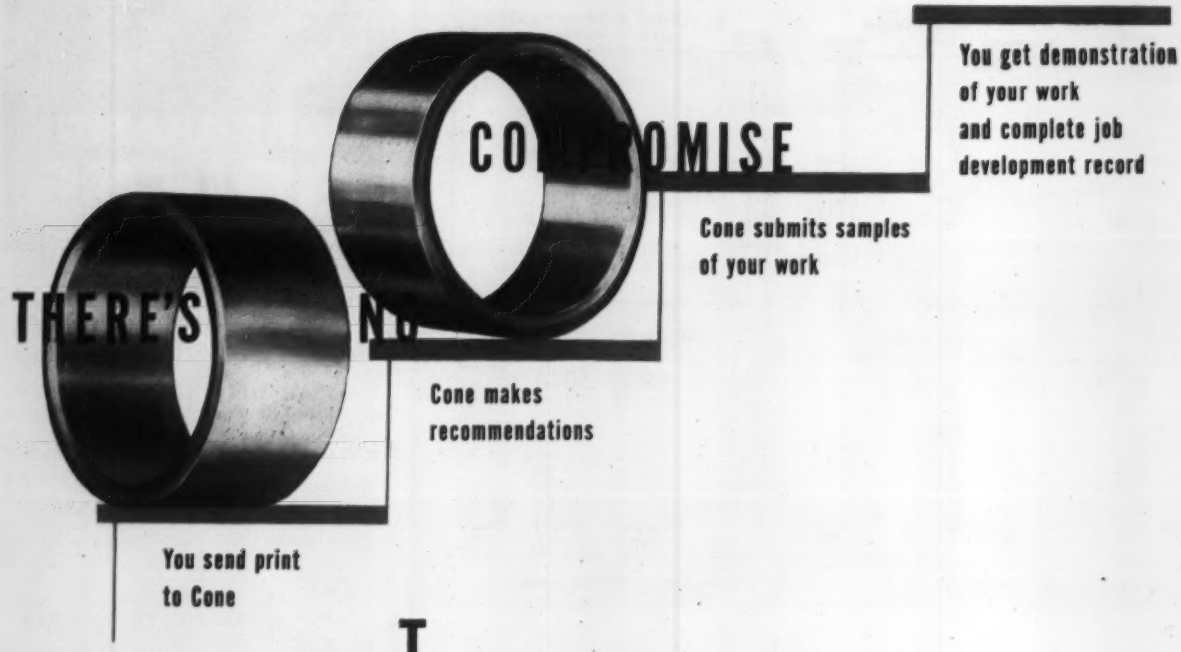
The latest result of Cooper Alloy Advanced Know-How is a new series of precipitation hardenable stainless alloys designed to fill the following needs: 1) a ductile high strength alloy of medium hardness 2) a high strength and high hardness alloy with fair ductility 3) a very high hardness alloy of low ductility. All three alloys have excellent corrosion resistance—equal or superior to type 316 stainless. More complete data on request.

QUIKUPL® CUTS COSTS

A series of interesting case histories showing how Quikupl—the patented stainless steel fitting which can be assembled and disassembled without threading, flaring or welding—cuts time and costs, appears in a recent issue of NEWSCAST. If you're not on the regular mailing list for this bi-monthly technical magazine, ask for your free copy of the May issue.

COOPER ALLOY
CORPORATION • HILLSIDE, N.J.

No. 6 in a series


THERE'S NO
COMPROMISE
You send print to Cone
Cone makes recommendations
Cone submits samples of your work
You get demonstration of your work and complete job development record

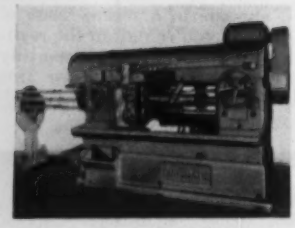
There is no adequate compromise with efficient production practices, if you are in business for a profit.

But you don't always know just how competitively efficient your equipment is. Case histories of what the other fellow is doing are sometimes garbled. At least the poor ones are not advertised. And conditions vary in all plants. Sometimes you have reason to be more concerned with what you don't want in new equipment than with what you do want. Cone believes too much is at stake for a machine to go into a line unequipped for the job, with either carbide or hss tools.

The Conomatic Carbide Development treats each job individually from standpoint of work, machine, tools, and operating personnel.

DATA FOR COMPARISON

Part	Bushing	Length	⅝"
Machine	1⅜" Conomatic	Hole Dia.	1¼"
Tools	100% Carbide Tipped	RPM	825
Material	8620	Time	14.8 Secs.
Stock Size	1⅝"		



Conomatic

For particulars send for "Four Steps With Cone"

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U.S.A.

J. EDWARD McLEAN
. . . Stubnitz Greene Spring v.p.

J. Edward McLean was elected vice president in charge of research and engineering of **Stubnitz Greene Spring Corp.**, Adrian, Mich. He was vice president of Flannery Mfg. Co. and Fort Pitt Mfg. Co.

Federal Malleable Co., West Allis, Wis., elected **Carl L. Liebau** president-treasurer. He was executive vice president. **Norman N. Amrhein**, secretary-treasurer, was elected vice president-secretary. Mr. Liebau succeeds the late **W. H. Heatley.**

Dan W. Burns was made director of procurement at **Menasco Mfg. Co.**, Burbank, Calif. **A. H. Knight** was made assistant purchasing agent.

James J. Munns was elected a senior vice president of **National Steel Corp.**, Pittsburgh.

L. N. Goodell was made manager of **Bryant Electric Co.**, Bridgeport, Conn., subsidiary, Westinghouse Electric Corp.

Bridgeport Brass Co., Bridgeport, Conn., appointed **Gilbert C. Mott** director of engineering, a new post. He was chief industrial engineer. **John F. Kiernan**, chief plant engineer, is now chief engineer.

W. Roy Willard was made assistant to the president of **Buffalo Steel Corp.**, Tonawanda, N. Y.

CONDE HAMLIN
. . . DeWalt Inc. president

Conde Hamlin, executive vice president since November of last year, was elected president of **DeWalt Inc.**, Lancaster, Pa., subsidiary, American Machine & Foundry Co.

Poor & Co., Chicago, elected **Max K. Ruppert** executive vice president and **Eugene C. Bauer Jr.** vice president. Mr. Ruppert is president of P. & M. Co., and Mr. Bauer is president of Kensington Steel Co., both subsidiaries.

W. H. Osborne was elected executive vice president, **Acme Aluminum Foundry Co.**, Chicago, continuing secretary and treasurer. **C. L. Sidinger** was made vice president in charge of manufacturing and engineering.

Symington-Gould Corp., New York, elected **R. C. Loudon** and **H. A. Mason** vice presidents and **James S. Thompson Jr.** executive assistant to the president. Mr. Loudon continues as comptroller, Mr. Thompson as secretary.

Kenyon Y. Taylor heads **Beloit Tool Corp.**, Beloit, Wis. He recently resigned as executive vice president and general manager of Besly-Welles Corp.

J. Russell Powell was made works manager, Cleveland Works, **Jones & Laughlin Steel Corp.**, to succeed **Howard H. Shakely**, who was assigned to the general office in Pittsburgh as consultant to the chief engineer. **William P. Smith** was made assistant works manager at Cleveland to succeed **S. C. Faddis**, assigned to the Detroit area as contact metallurgist.

Ted Ray was made director of technical surveys at **Designers for Industry Inc.**, Cleveland. He was on the sales engineering staff of Motch & Merryweather Machinery Co.

A. J. Stetter was made sales manager for **Markle Steel Co.**, Houston.

E. F. Foster was made manager of purchases for **Wyatt Metal & Boiler Works**, Houston. He succeeds **J. S. Godwy**, resigned.

James W. Mason was made general superintendent-manufacturing at the **Eclipse Machine Division**, Bendix Aviation Corp., Elmira, N. Y.

Hellmuth Walter was named director of research at **Worthington Corp.**, Harrison, N. J. **Robert S. Sherwood** was made assistant director-research.

George G. Raymond Jr. was elected president, **Raymond Corp.**, Greene, N. Y., succeeding his father, **George G. Raymond Sr.**, now chairman of the board.

American Welding & Mfg. Co., Warren, O., appointed **Verne Wildman** general superintendent; **Leo D. Dunlap**, assistant general superintendent; and **John P. Lynn**, assistant manager of manufacturing.

Marion Power Shovel Co., Marion, O., appointed **Robert Campello** sales manager. He formerly was with the Washington office of Bucyrus-Erie Co.

R. E. Zahn was appointed manager of tool steel sales for the Dayton, O., district of **Allegheny Ludlum Steel Corp.**

George G. Lindholm was made manager, valve and fitting department, **Crane Co.**, Chicago. He succeeds **F. J. Wilkey**, who was named special representative of Crane's industrial sales division. **Thomas D. Kelly** succeeds Mr. Lindholm as manager of the Chicago branch.

William L. Folkerts was named di-

EDWARD P. GILLANE

WILFRED J. PENDER

. . . Potter & Johnston president and v.p.

rector of the new product research division of **Gray Mfg. Co.**, Hartford, Conn.

Edward P. Gillane was elected president and **Wilfred J. Pender** vice president and factory manager, **Potter & Johnston Co.**, Pawtucket, R. I., subsidiary of Niles-Bement-Pond Co. Mr. Gillane was vice president and continues as general manager. Mr. Pender was factory manager.

James D. Lightbody and **Matthew I. Cotabish** joined **Cleveland Graphite Bronze Co.**, Cleveland. Mr. Lightbody, for the last two years vice president-manufacturing at Cambridge Corp., will be a member of the president's staff. Mr. Cotabish was director of industrial relations, Barth Corp. He will be staff assistant to the personnel director.

James R. Pumphrey was made administrative assistant to the general sales manager of **Brainard Steel Division**, Sharon Steel Corp., Warren, O. He was assistant sales manager, tube and strip division.

Mathias Klein was made chief manufacturing engineer of **Marquardt Aircraft Co.**, Van Nuys, Calif.

Leach Corp., Los Angeles, appointed **K. F. Julin** general manager. **C. R. Harmon**, former president, will serve as a consultant.

Adolph Burstein was made assistant chief engineer and **S. G. Frank Haas Jr.** chief development engineer of the San Diego, Calif., division of **Convair**, General Dynamics Corp.

Carl E. Bellew was made sales manager, molded and extruded products, mechanical goods division, **United States Rubber Co.** He is at the Passaic, N. J., plant.

Robert F. Bourne was made director of sales, national accounts, for **Colorado Fuel & Iron Corp.**, New York. He is succeeded by **Edwin F. Lord** as general manager of sales, Claymont Steel Products, a department of CF&I's Wickwire-Spencer Steel Division. Mr. Lord was sales manager for Claymont's fabrication department.

Kenneth E. Jenkins, sales manager, industrial hydraulics division, **Parker Appliance Co.**, Cleveland, fills the new position of district manager for eastern Canada. He is replaced by **Harold E. Lewis. Walter A. Keller** was made purchasing agent, engine accessories division, and **Kent Hawkins** was made division staff engineer.

Dr. Bernard Kopelman was made chief engineer, atomic energy division, **Sylvania Electric Products Inc.**, Bayside, N. Y.

Charles W. Frederick was appointed director of engineering and **Clyde W. Truxell Jr.** works manager at Detroit Diesel Engine Division, **General Motors Corp.**, Detroit. Mr. Frederick replaces **Laurence S. Sheldrick**, named technical assistant to the general manager. Mr. Truxell replaces **Albert F. Davis**, now director of engineering and manufacturing at Diesel Equipment Division, Grand Rapids, Mich.

Glen Hartman was made assistant manager-operations, **Ohio Seamless Tube Division**, Copperweld Steel Co., Shelby, O.

Charles A. Lindsay was made general manager, container division, **Stauffer Chemical Co.**, Los Angeles.

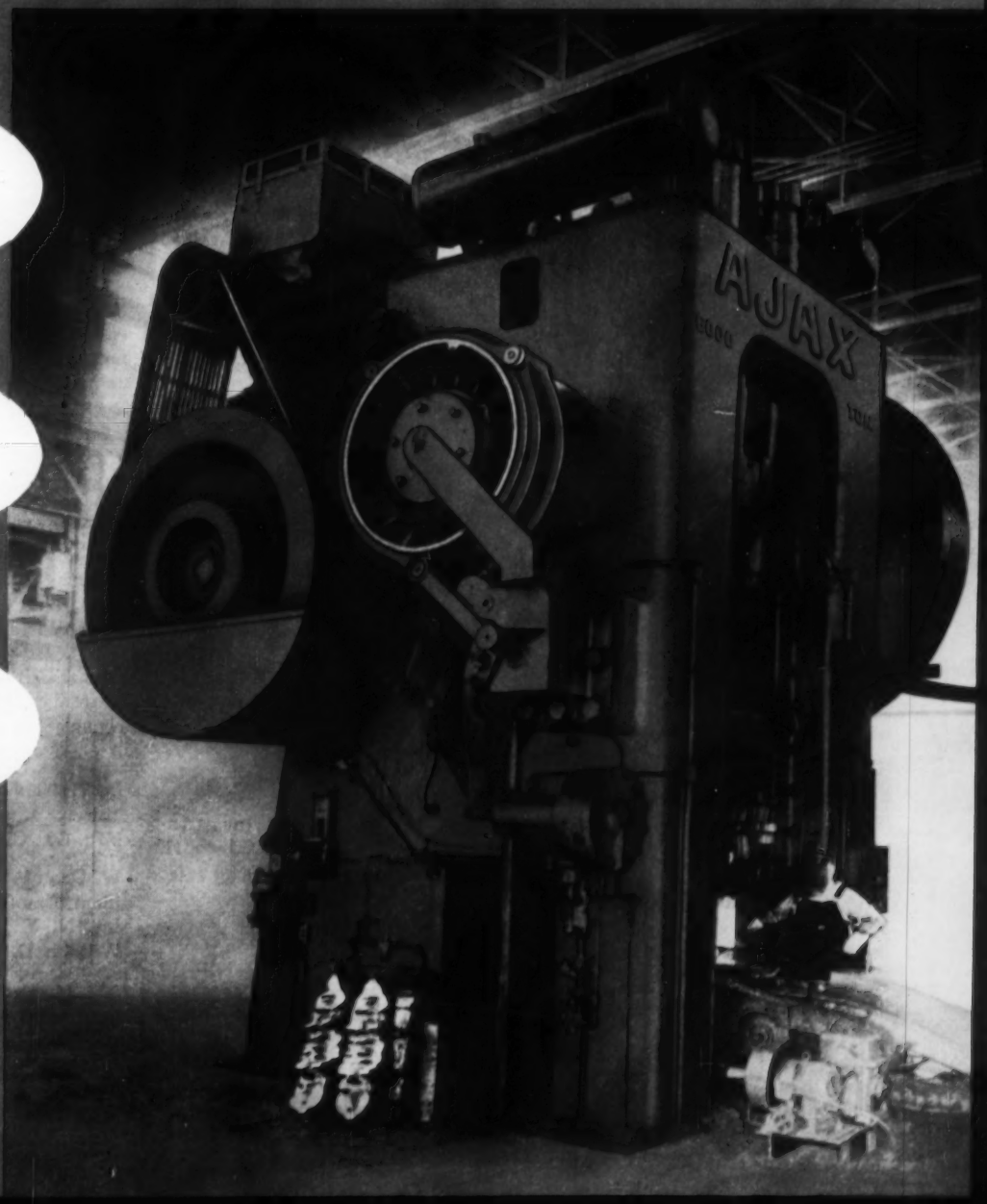
Sir Robert A. Watson-Watt was named president and board chair-

ROBERT F. BOURNE

EDWIN F. LORD

. . . appointments at CF&I and Claymont Steel

AJAX
high speed
FORGING PRESSES



SOLID STEEL FRAME

AIR CLUTCH OPERATED

SIZES 300 TON TO 8000 TON

Write for Bulletin 75-C

THE AJAX MANUFACTURING COMPANY
EUCLID BRANCH P. O. CLEVELAND 17, OHIO
110 S. DEARBORN ST., CHICAGO 3, ILL. • DEWART BLDG. NEW LONDON, CONN.
W. P. WOOLDRIDGE CO.
1209 BURLINGAME AVE., BURLINGAME, CAL. • 6440 FLEET ST., LOS ANGELES 22, CAL.

PAUL S. DICKEY

HARVARD H. GORRIE

RAYMOND D. JUNKINS

. . . Bailey Meter president and vice presidents

man of **Logistics Research Inc.**, Redondo Beach, Calif.

Joseph S. Pickard Jr. was made Houston district office manager of **Revere Copper & Brass Inc.** He succeeds **H. P. Stephenson**, now assistant manager-merchandise sales in the Dallas division.

John W. Murchie was appointed an assistant chief industrial engineer for **Republic Steel Corp.**, Cleveland. He succeeds **Samuel C. McDowell**, now division manager of the Pressed Steel Division.

Thomas F. Wrinn was made supervisor of the tool sales department of **Billings & Spencer Co.**, Hartford, Conn.

Richard W. C. Barr is manager of the Boston branch of **General Controls Co.**

Richard F. Harvey, former chief metallurgist of Brown & Sharpe Mfg. Co., joined **Braeburn Alloy Steel Corp.**, Braeburn, Pa. as a member of its metallurgical staff.

George A. Fizgerald was named a vice president of **Permacel Tape Corp.**, New Brunswick, N. J.

Executive changes at **Bailey Meter Co.**, Cleveland, include: **Paul S. Dickey**, former vice president and a director, elected president to succeed **Robert S. Coffin**, now chairman of the executive committee and management consultant; **Harvard H. Gorrie**, chief engineer, elected a vice president in charge of engineering; and **Raymond D. Junkins**, head of the patent department, elected a vice president and director.

Arthur Townhill was named chief engineer, **Harvill Corp.**, Los Angeles.

Franklin K. Zimmerman resigned as president of Lynch Corp. to become executive vice president of **George Getz Corp.**, Chicago.

Farrel-Birmingham Co. Inc., Ansonia, Conn., appointed **Edwin H. Ahlefeld Jr.** assistant general sales manager.

J. A. Zurn Mfg. Co., Erie, Pa., appointed **Harry E. Goss** assistant to the president in charge of manufacturing, distribution and warehouse operations, West Coast. He has headquarters in San Francisco.

Following the retirement of **Arch A. Warner** as president and general manager, **Mechanics Universal Joint Division**, Borg-Warner Corp., Rockford, Ill., **L. G. Porter**, administrative vice president of Borg-Warner, will serve temporarily as president of the division.

John R. McPhee was elected vice president-sales, **Ironsides Co.**, Columbus, O. A director of the company, he was vice president-sales, Palmoshield Division.

Carl F. Freedman, vice president-general manager, was elected executive vice president, **American Agile Corp.**, Maple Heights, O.

D. T. Hanlon was made plant engineer, stamping division, **Eaton Mfg. Co.**, Cleveland.

W. Dean Wallace was elected president, **Camillus Cutlery Co.**, Camillus, N. Y., to succeed his father, **William D. Wallace**, resigned.

S. L. Crawshaw was named assistant to the president of **Philadelphia Gear Works Inc.**, Philadelphia.

OBITUARIES...

Emmett C. Dygert, 68, executive vice president and a director of **John Weekes & Son Co.**, Watertown, N. Y., died May 18.

Ray L. Newton, 63, assistant general sales manager, **Cadillac Motor Car Division**, General Motors Corp., Detroit, died May 17.

E. D. Frank, 69, director and sales vice president, **National Automatic Tool Co.**, Richmond, Ind., died May 5.

Walter G. Grierson, 72, chief engineer, **C. Hennecke Co.**, Milwaukee, died May 21.

Morris M. Miller, 67, treasurer and credit manager, **Waldes Kohinoor Inc.**, Long Island City, N. Y., died May 19.

a Natural when it comes to Passes

Typical Monarch Roll Turning Story

12¼ hrs.

vs

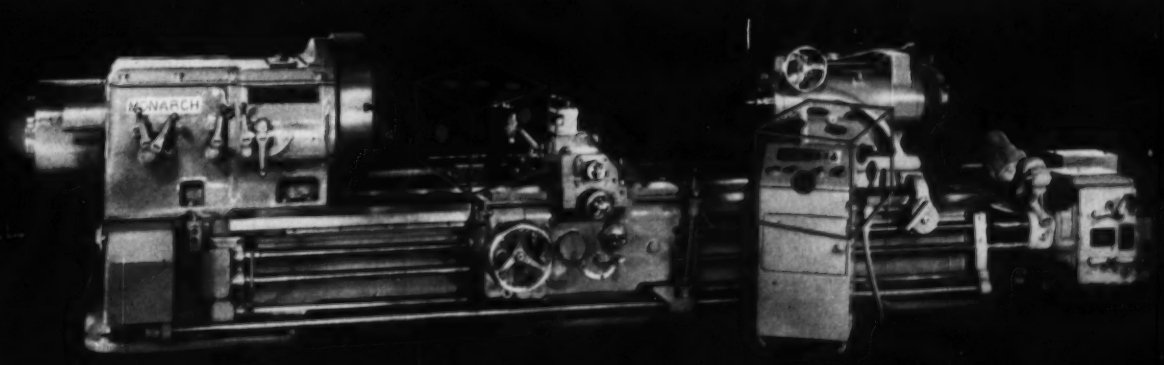
Old 31 hrs.

Why roll it the hard way when faster turning time is what comes naturally to our Heavy Duty Roll-Turner with Monarch-Keller controls? Every job report we ever got from a user confirms it! Consider this one:

Part is a 10″ diameter roll having 30″ body length and made of grain iron with a hardness of 60-65 scleroscope. It has 13 half-round passes ranging from 1⅝″ to 1 $^{13}/_{16}$″ diameter. Monarch rough turning time is 9¼ hrs.; finish turning time, 3 hours.—*total time, 12¼ hrs.*

For comparison, the most competent roll turner in the user's plant tried to compete on an old-style roll lathe. Working all-out, and much harder than the other operator, he still required 24 hrs. roughing time; 7 hrs. finishing time—*a total of 31 hrs.*

Why handicap yourself with costly old methods any longer? It's a sure bet that we can save time and money for you. Write for the complete story—illustrated Booklet #1302.



"SAVE IN MANY WAYS With The Monarch Heavy Duty Roll-Turner"

1. On all types of rolls which lend themselves to this method of turning, floor to floor turning time averages from ½ to ¼ of the former time.

2. With standard carbide turning tools with regular tool grinds, hundreds of form tools required by conventional methods are not needed. Tools can be changed with no sacrifice of contour accuracy.

3. With template controlled contour forming, matching rolls in pairs is unnecessary. Each roll turned from any given template is identical. One of pair of rolls can be redressed or new roll turned without matching the other.

4. When redressing a roll, the operator may quickly check the point of greatest wear with the corresponding point on the template after which he can be certain that the entire roll will clean up on the first pass.

5. The same template is used for both the rough and finish passes. Thus finishing immediately follows roughing with no set-up change other than the required tool change.

6. Operator cannot modify roll shape. As the template form is dimensionally the same as forms to be turned on the roll, their longitudinal placement and relationship are sure to be accurate.

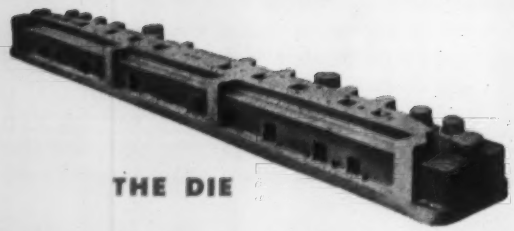
Monarch

TURNING MACHINES

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

THE MONARCH MACHINE TOOL COMPANY
Sidney, Ohio

AT NEMCO FOUNDRY: ANOTHER PROBLEM SOLVED BY CITIES SERVICE CORE OIL

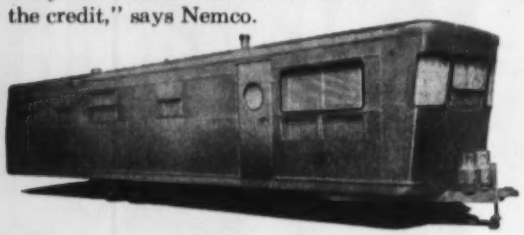


THE DIE

The die pictured here was cast at Nemco Foundry for use by the Spartan Aircraft Company in producing roof ribs for its Spartan Mobile Home. Difficult to produce, it required 10 cores 2⅝″ x 2⅝″ square and 25 cores, quarter-circle in shape, from ¾″ to 1″ in diameter. Semi-circular shape was necessary to core curved slots from top of die to sides. Holes had to be clean and free from obstruction, allowing stamped slugs to fall through. Nemco relied on Cities Service Delco Core Oil to help meet exact specifications. "A smart choice," says J. A. Dean, General Manager. "Delco Core Oil made the job far easier."

THE ROOF RIBS

The roof ribs of this Spartan trailer, cast from the die produced at Nemco, are visual proof of a job well done. "The great strength and high collapsibility of Cities Service Delco Core Oil share a lot of the credit," says Nemco.



THE FINISHED PRODUCT

The finished product is this handsome Spartan Mobile Home awaiting shipment to consumer. Spartan's rigid specifications help make it one of the safest and best on the market.

Difficult casting of die to form roof ribs for Spartan Mobile Home made easier by Cities Service Delco #36

Located in Tulsa, Oklahoma, Nemco Foundry enjoys attacking the really tough jobs and making them easier. And often helping to spearhead the attack is Cities Service, as described here by J. A. Dean, General Manager:

"Recently Cities Service Delco #36 Core Oil again solved a tough job for us in fulfilling the requirements for a casting for the Spartan Aircraft Company, makers of Spartan Mobile Homes. The casting was a bottom shoe for blanking die to make roof ribs for the all-aluminum shells for Spartan trailers.

"The die was of Nemcoloy, Type AL, an alloyed grey iron. It was 106″ long, 8″ thick and 13½″ wide, and weighed 2,018 lbs. cleaned.

"It required 10 cores 2⅝″ x 2⅝″ square. In addition, it demanded 25 cores, quarter-circle in shape, ranging from ¾″ to 1″ in diameter. Semi-circular design was necessary in order to core curved slots from the top of the die to the sides of the die. Holes had to be clean and free of obstructions allowing the stamped slugs to fall through the die to the outside and not hang up.

"Cities Service Delco #36 Core Oil enabled us to meet these requirements perfectly. We certainly recommend it where great strength and high collapsibility are needed."

Like Nemco, scores of other foundries have reported unusual results with problem-solving Cities Service Core Oils. Nor does the praise end with the product . . . for time and again the solution for the proper core oil has resulted from the knowledge, understanding and experience of a Cities Service Lubrication Engineer. If you have a lubrication problem, why not talk it over with one of these Cities Service experts? Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Ford Shifts Into High

Expands automatic transmission plant to keep pace with growing demand for component

FORD MOTOR CO., Detroit, is constructing a 580,000-sq-ft addition to its Livonia, Mich., automatic transmission plant. It is the first project in the firm's $625-million facilities expansion program. Initial production in the new area is scheduled to start in mid-1956.

The Livonia expansion is the first step by the Automatic Transmission Division to provide additional production capacity to keep pace with over-all company expansion and to meet increased demand for automatic transmissions and Ford Motor Co. products in general, says M. L. Katke, general manager of the division.

Connor Spring Opens Plant

Connor Spring Mfg. Co. opened a precision spring manufacturing plant at 1404 Slocum St., Dallas. Douglas Bickenbach is branch manager. Connor Spring maintains office and manufacturing facilities in San Francisco and Los Angeles.

March Corp. Organized

March Corp. has been organized to make applied technical sales of specialized products and services in the high-temperature, corrosion resistance and metallurgical fields. Offices are at 18101 James Couzens Highway, Detroit. Raymond J. Shillum is president.

Sundstrand Machine Expands

Sundstrand Machine Tool Co., Rockford, Ill., completed an addition to its Machine Tool Division facilities. The plant, located at Belvidere, Ill., will be used primarily for the assembly of the larger models of standard Rigidmils, special machines and transfer equipment.

Chemical Firm Builds Plant

Mitchell-Bradford Chemical Co., Stratford, Conn., built a new plant to accommodate increased production, larger offices and research facilities. The firm makes blackening processes for ferrous and nonferrous metals, metal cleaners, rust preventives, plating specialties and heat-treating salts.

Koppers To Build Coke Ovens

U. S. Pipe & Foundry Co., Birmingham, is increasing its coke making capacity to 3500 tons a day. It awarded a contract to Koppers Co. Inc., Pittsburgh, for construction of a battery of 30 chemical-recovery coke ovens. U.S. Foundry is a large producer of cast iron pipe.

Selas Corp. Building Plant

Selas Corp. of America, Philadelphia, is constructing a $1-million plant at Dresher, Pa., which will double its present floor space. The company makes automatic heat treating, brazing and other heat processing equipment.

Peninsular Opens Warehouse

Peninsular Steel Co. opened a large warehouse at 24401 Groesbeck Highway, Warren township, Detroit. It will house the general offices for the extensive activities of this steel warehousing firm. Equipment includes electrically controlled overhead cranes and monorails; pushbutton-controlled machines for bar stock cutting and cold sawing; contour burning equipment; and automatic equipment for spotting freight cars from the firm's siding. Stocks include tool and die steels, alloy bars, cold-drawn bars, steel plates, drill rod and flat-ground die steel.

Will Make Ferrochrome

Tennessee Products & Chemical Corp., Nashville, Tenn., expanded its operations to include production of ferrochrome in one of its two electric furnace plants at Chattanooga, Tenn. This marks the first step in a program for further diversification of end products launched by the firm following its acquisition by Merritt-Chapman & Scott Corp., New York. In the ferroalloy field, the company's production had been confined to ferromanganese, ferrosilicon and silicomanganese.

Roebling Adds Furnace

New installation, coupled with galvanizing furnace, provides four types of operations

A NEW patenting furnace has been installed at the Roebling, N. J., works of John A. Roebling's Sons Corp., Trenton, N. J. It is in the galvanizing shop of the Steel Wire Mills Division.

This installation, coupled with a galvanizing furnace, makes for a highly versatile and flexible unit, says Raymond S. Worth, manufacturing manager of the division. The patenting furnace will add important new production facilities, expediting the efficient manufacture of wire and wire products.

Roebling, a wholly owned subsidiary of Colorado Fuel & Iron Corp., makes products ranging from the finest watch spring wire to electrical conductors and giant bridge-supporting cables.

Buys Air Compressor Line

American Brake Shoe Co., New York, has taken over the air compressor business of Lynch Corp.'s Defiance, O., plant. The line ranges from ⅓ to 10-hp compressors.

Firm Will Make Carbide Tools

R. C. Heartwell, L. J. Heartwell and Anne E. Graham organized Grawell Carbide Tool Co. to manufacture solid carbide cutting tools. Offices are at 5680 12th St., Detroit 8, Mich.

ASSOCIATIONS

Raymond M. Shock resigned as executive secretary of the **National Association of Metal Finishers Inc.**, Washington.

Henry F. Dever was elected president of the **Scientific Apparatus Makers Association**, Chicago. He is president of Minneapolis-Honeywell Regulator Co.'s Brown Instruments Division, Philadelphia. T. M. Mints, president, E. H. Sargent & Co., Chicago, was re-elected treasurer of SAMA.

Charles L. McDonald Sr. was named Machinery Dealer of the Year by the **Machinery Dealers**

National Association, Washington.

George C. McKann Jr. has been appointed executive director of the Chicago branch, **National Metal Trade Association,** that city. His 25 years of business organization experience was acquired with New Jersey and Illinois groups, including the Chamber of Commerce and Korhumel Steel & Aluminum Co. in Evanston, Ill.

Officers of the association's Chicago branch include: President, W. S. North, president, Union Special

GEORGE C. McKANN JR.
. . . executive director, NMTA

Machine Co.; vice president, W. A. Peterson, Peterson Products Corp.; treasurer, W. H. Rietz, Ilg Electric Ventilating Co.

A. Carl Weber, director of research and engineering, Laclede Steel Co., St. Louis, was elected chairman of the board of the **Rail Steel Bar Association,** Chicago. He succeeds William A. E. Woods, Texas Steel Co., Ft. Worth, Tex. Other officers include Gilbert Daley, Sweet's Steel Co., Williamsport, Pa., treasurer; W. J. Jacobs, secretary.

The **Metal Powder Association,** New York, elected Morris Boorky president. He is president of Presmet Corp., Worcester, Mass., and chairman of the association's Fabricators Division. B. T. du Pont, general manager, Plastic Metals Division, National-U. S. Radiator Corp., Johnstown, Pa., was elected chairman of the board. R. D. Ponemon, general manager, Pyroferric Co. Inc., New York, was elected chairman of the Iron Powder Electronic Core Division and vice president of the association. E. H. Klein, manager, Metal Division, New Jersey Zinc Sales Co., New York, was elected vice president and chairman of the Powder Producers Division. D. L. Almquist, Stackpole Carbon Co., St. Marys, Pa., was re-elected chairman of the Ferrite Division and vice president.

Dr. R. F. Thomson, head of the metallurgy department of General Motors Research Laboratories Division, was awarded the John A. Penton Gold Medal by the **American Foundrymen's Society,** Des Plaines, Ill. The award was presented for "outstanding contributions to the society and the industry in foundry research, particularly in the field of light metals."

REPRESENTATIVES

Roll Formed Products Co., Youngstown, appointed Holmes & Stone Co., Houston, to represent the firm in western Louisiana, southern Oklahoma and eastern Texas. Roll Formed makes special and standard shapes, tubing, angles and channels.

Norton Co.'s Grinding Machine Division, Worcester, Mass., appointed Machinery Associates Inc., Wynnewood, Pa., its representative in the city of Washington. Machinery Associates also has the Philadelphia area.

Parker Appliance Co., Cleveland, appointed Ritter Engineering Co., Pittsburgh, and Industrial Piping Supply Corp., Bessemer, Ala., distributors of its tube and pipe fittings and tube fabricating tools.

Cooper Alloy Foundry Co., Hillside, N. J., appointed John Wilfert Co., Brooklyn, N. Y., distributor for its stainless steel valves, fittings and accessories.

Aluminum Industries Inc.'s Permite Paint Division appointed the following agents: K. J. Shaw Co., southern California, southern Nevada and Arizona; J. E. Thomas Co., Arkansas; John G. Wilsey of Wilsey-Southwest, Texas and Oklahoma; Jose P. Velez, Puerto Rico.

Westinghouse Electric Corp., Pittsburgh, appointed Foremost Electric Co., Peoria, Ill., a distributor of its motors and controls.

Hydra-Feed Machine Tool Corp., Ferndale, Mich., appointed G. A. Richey & Sons Co., Indianapolis, as distributor of its lathes.

Copes-Vulcan Division, Continental Foundry & Machine Co., Erie, Pa., appointed Hesler Co., Kansas City, Mo., as representative for its products, including boiler controls.

NEW ADDRESSES

Dixie-Cowdrey Machine Corp., special machinery builder, moved into a $600,000 plant which has 60,000 sq ft of manufacturing space.

R. C. Cash, sales representative for **Wolverine Tube Division, Calumet & Hecla Inc.,** Detroit, moved his headquarters from Memphis, Tenn., to Birmingham. He may be reached through Wolverine's Decatur, Ala., plant. C. T. Fuller is southwestern district sales manager.

Imperial Machine Co., manufacturer of aircraft parts, moved to enlarged quarters at 585 N. Prairie Ave., Hawthorne, Calif.

Huffhines Steel Co. moved into a new office building at 2201 W. Commerce St., Dallas. The company fabricates reinforcing bars.

H. K. Porter Company Inc.'s Leschen Wire Rope Division, St. Louis, moved its New York district office and warehouse to 219 Emmet St., Newark, N. J.

Howe & Fant Inc., manufacturer of turret drilling machines and attachments, moved into a larger plant at 20 Fitch St., East Norwalk, Conn.

AJAXOMATIC POURING UNIT

in Operation at Montrose Division,

BENDIX AVIATION CORPORATION

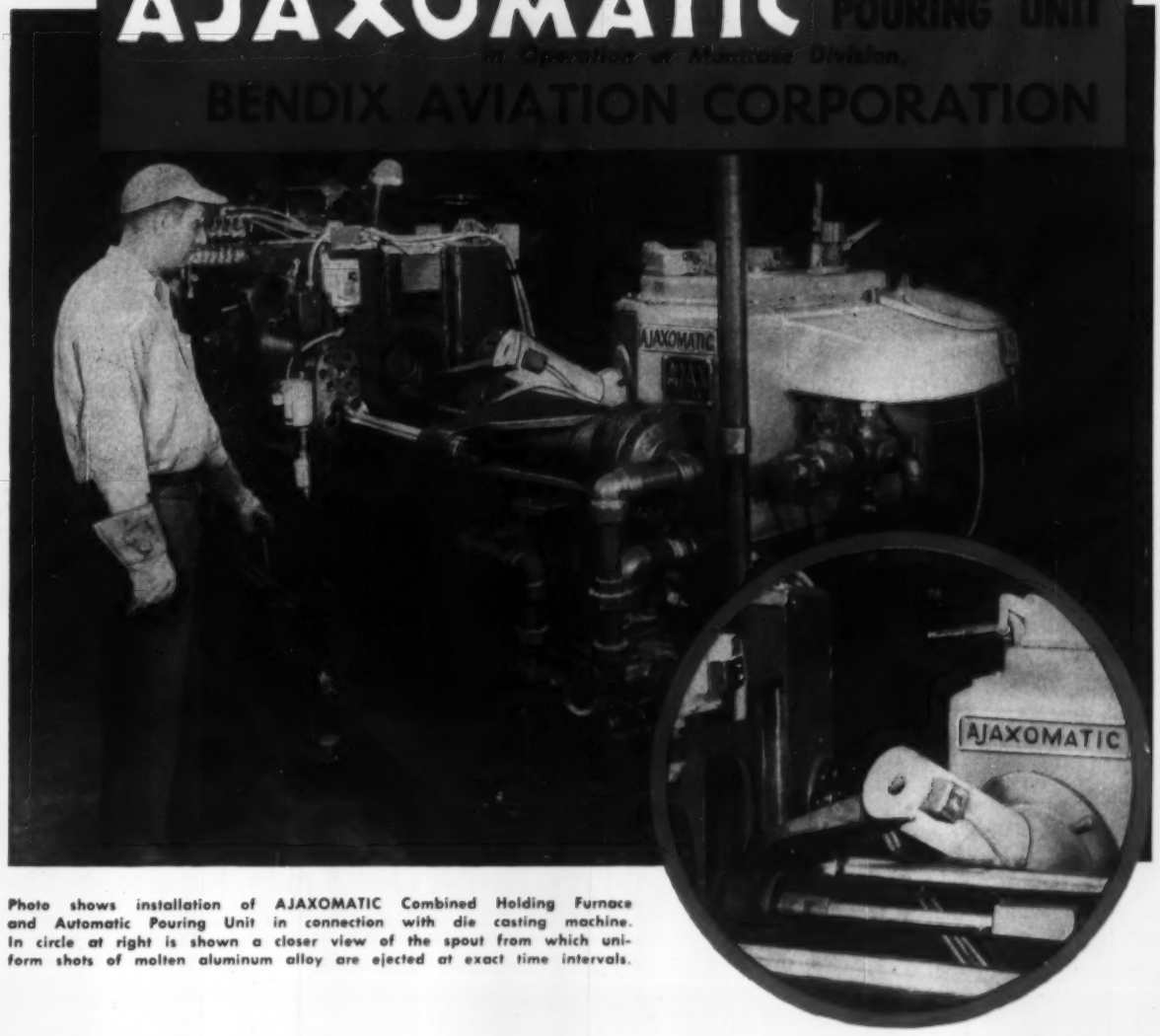


Photo shows installation of AJAXOMATIC Combined Holding Furnace and Automatic Pouring Unit in connection with die casting machine. In circle at right is shown a closer view of the spout from which uniform shots of molten aluminum alloy are ejected at exact time intervals.

NOW completely automatic die casting of aluminum alloys is possible in smaller quantities than formerly, and at reduced cost. This fact should be of special interest to the manufacturer who has die casting machines in operation and is doing hand ladling. The unit is entirely sealed, the operator feels no heat, accident hazard is eliminated.

This small, compact AJAXOMATIC* unit will increase production of die castings by as much as 25%, because it delivers regular, uniform quantities of metal into the die casting machine with no delay, immediately after dies are closed. The spout itself is heated and the temperature of each metal shot remains constant.

For further information send for descriptive folder

*Trade Mark Registered U.S. Patent 2,674,640 and Pending U. S. Patent Applications

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX TAMA-WYATT

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

I Nearly Blew My Top!

"The other day the Detrex man pointed out to me that metal cleaning and surface preparation accounts for ¼ to ⅓ of all the operations in the average metal-working plant. It sure caught me by surprise and, frankly, it started me thinking about our own plant. After a complete survey we found over ¼ of all our operations were of that type.

"What was immediately apparent to me was how important even the smallest single savings would become when multiplied by the number of operations involved. It certainly changed my way of thinking on the importance of metal cleaning and surface preparation. When I think of how little regard we had been giving those operations, *I nearly blew my top.*

"Take, for example, our metal parts washing operations. By switching to Detrex cleaners we were able to effect savings of a size we never before thought possible. One of the things that really impressed us about Detrex Emulsions was the fact that they not only do an excellent job of cleaning but they also retard rust . . . and all in one operation. That alone saved us considerable money.

"Why don't you let the Detrex man in your area make the same type of survey in your plant? It isn't going to cost you a penny if he doesn't show you how you can save money. If he does, you'll probably buy some chemicals and/or equipment, but more important you'll be saving big dollars. You have nothing to lose and everything to gain. Why not give him a crack at it next time he calls?"

**Detrex alkaline and emulsion cleaners have reduced manufacturing costs in hundreds of plants. They provide better and more positive cleaning action... faster and at lower cost.*

Service with a Saving!

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DEGREASERS • DEGREASING SOLVENTS • WASHERS
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EQUIPMENT • PHOSPHATE COATING PROCESSES

STEEL
June 6, 1955

Technical Outlook

HIGH HEAT RUBBER—General Electric says it has developed a new type silicone rubber that remains flexible at 600°F. Anticipated applications are in kitchen oven door seals and parts for hot materials handling equipment in the glass, ceramics and metals industry.

MORE DIE LIFE—A sound wave treatment (ultrasonic) used on tools and dies is increasing service life 2½-times. Called "Dalton-Dize," by its developers, the Dalton Steel Corp., Cleveland, the process permits use of die steels at or near their maximum hardness. First application was on thread rolling dies. It's now being used on coining dies, washer dies, punches, shearing blades and slitting knives.

WANT A REACTOR?—Babcock & Wilcox is marketing a line of three commercial atomic reactors, but designs may be improved before you buy one. Two projects showing promise: The use of carbon steel to replace stainless in reactor heat exchangers, and development of gasketed fuel ports that will prevent radioactive leakage. The easy-opening ports are needed on commercial reactors where cores may have to be changed as often as once a month.

TITANIUM UNDER TEST—National Research Corp. and Monsanto Chemical Co. will test a new fused salt process for making titanium in a pilot plant having a capacity of 1000 lb a day. Work is to be carried out under contract with the General Services Administration.

GSA has also contracted with Horizons Inc., Cleveland, to evaluate a process for regeneration of titanium from impure scrap.

OXYGENATED CASTINGS—Gray iron castings absorb oxygen during storage and in use, a Battelle Memorial Institute study concludes. Newly cast irons rarely exceed an oxygen content of 0.004 per cent by weight, but old ones may contain as much as 0.047 per cent. The absorption mechanism is unknown. Nodular iron showed the lowest absorption rate of types tested.

SINTERED STAINLESS—Ultimate tensile strength of 108,000 psi has been obtained with 18-8 stainless strip—it is roll bonded from powder, sintered, rerolled and annealed. The product has qualities comparable to wrought strip, with the added property of random crystal orientation.

ALUMINUM HOPPERS—Drop-bottom trailer trucks made of sigma-welded aluminum are hauling lignite for the boilers of Alcoa's Rockdale, Tex., plant. The 44-ton capacity trailers are 4 tons lighter than comparable steel trailers and resist acid attack of the coal.

HEAT RESISTANT AND DUCTILE—Ductile iron has proved so successful in apron and looper guides on hot rolling mills that one company is switching completely to the material because of lower maintenance. Castings weigh 1710 and 3210 lb, respectively, and are subjected to constant water spray to prevent sagging with the heat.

TUBE DEOXIDATION—Allow predeoxidized molten steel to stand for about 10 minutes, then add deoxidizing alloys with a high affinity for oxygen. That's the basis of a new process for making steel free of included oxides. It's being introduced in this country by Manufacturers Chemical Corp., New York. The deoxidizing metals are confined in high-melting protective containers called Rodox tubes.

Metalworking Outlook—p. 41 *Market Outlook—p. 119*

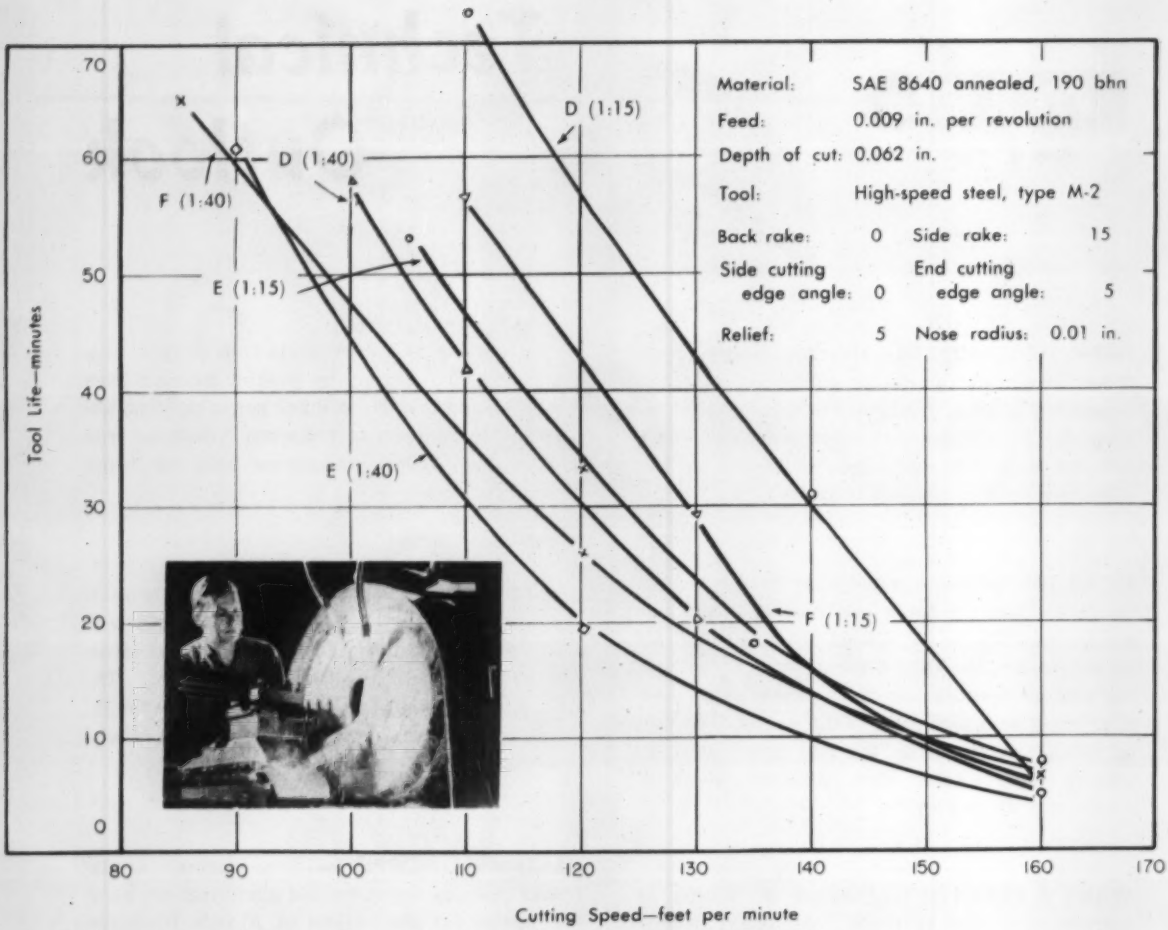


Fig. 1—How choice of water-soluble cutting fluids affects cutting speeds and tool life

How To Buy Cutting Fluids

By JOHN A. BOYD
Vice President
Van Straaten Chemical Co.
Chicago

SCIENTIFIC PURCHASING of tool lubricants goes far beyond the simple comparison of price. You may discover dramatic savings by matching tool lubricant costs against performance.

A compound that sells for $1.30 a gallon, for instance, compared with another selling at 50 cents a gallon, may bring a savings of $8000 per year, per machine. Production cost studies and laboratory research have shown that tool lubricant performance is as important in determining over-all machining costs as is the composition of the metal being cut, or the use of the correct tool and tool design.

Investigate — Metcut Research Associates of Cincinnati has made a study of cutting fluids which shows that a plant could possibly obtain a threefold increase in tool life by making the proper selection of compound and its concentration (Fig. 1).

If increases in tool life are not important to a plant, then cost savings can still be made with better quality tool lubricants by increasing production speeds. For instance, Fig. 1 shows that on 8640 steel it is possible, by changing the water-soluble lubricant, to increase cutting speeds from 120 up to 148 sfm without changing tool life.

The same sort of thing holds true for the oils. We may extend

tool life or raise cutting speed by proper lubricant choice (Fig. 2).

Where To Look — Some plants have been unable to see these differences reflected in their production cost studies because of their failure to eliminate factors preventing true comparison. To obtain honest results, here are some suggestions to observe when setting up a program to study tool lubricant performance and cost:

1. Avoid a study on obvious trouble jobs where the machine or tooling is so badly set up that no difference in tool lubricant performance will be observed. For instance, one plant attempted a study on a broaching operation that had been exceedingly troublesome from a tool-life viewpoint.

All broaching compounds tested gave the same results. Why? The broach was underpowered for the job. This made tool life extremely short. Underpowering of the machine caused poor finish because of chattering and resulting tool breakdown which was not a result of normal wear.

Thus, if no difference in the tool lubricants appears in your tests, some other factor, such as tool design or machine condition, may be at fault. This may so shorten tool life that no basic difference in tool lubricant performance results.

2. Make your study under conditions where the operator will not suffer from the results. An operator who feels that an operation may be re-timed if tool life is increased, will certainly not co-operate, and will in many instances "throw" a program. Operator confidence and co-operation are essential to get accurate results.

3. Avoid comparisons on machines where the results are erratic due to inconsistent metal structure or tool-grinding differences. For instance, on a tapping operation where tap life may vary from 10 to 500 pieces per tap grind, no satisfactory comparison of tool lubricants can be made. These differences in tap life made a good statistical study impossible.

4. Start with an operation where records of tool life and performance have been kept consistently and results do not vary widely. The record should be detailed enough so that any performance difference can be easily determined.

5. Select operations where operator technique does not materially influence performance on the operation. For instance, an automatic-feed machining operation will give more consistent results than a hand-feed operation. A study of the automatic-feed operation will make it easier to determine differences in lubricants.

Check These—What should be considered in a cost report? Here are some things which would be included in a typical study comparing tool lubricants in a cut-

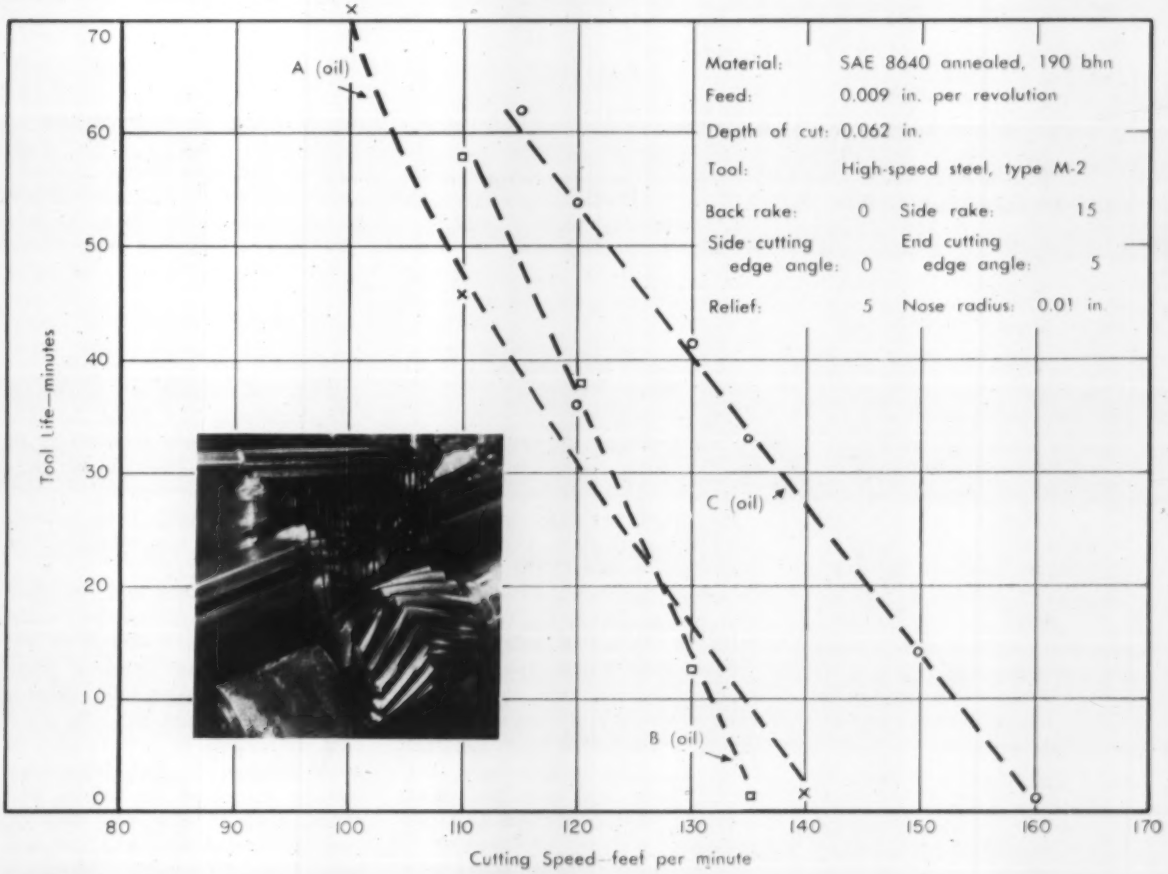


Fig. 2—How choice of cutting oil affects cutting speeds and tool life

Fig. 3—Typical cost study of tool lubricants

(operation: turning 416 stainless)

	LUBRICANT A	COSTS	LUBRICANT B	COSTS
Tool lubricant price	$1.77 a gal		$1.89 a gal	
Concentration used	30-1		30-1	
Cost of 30 gal of tank mix (changed each week)		$1.77		$1.89
Average number of pieces produced for each grind of set of tools	7		28	
Average number of regrinds of set of tools per day	4		1	
Average number of regrinds of set of tools per week	20		5	
Time required to grind a set of tools	90 minutes		90 minutes	
Tool grinder's rate	$2.30 an hr		$2.30 an hr	
Regrinding costs per week		$69.00		$17.25
Cost of set of tools (new)	$14.50		$14.50	
Sets of tools used each week	10		2.5	
Tool costs per week		$145.00		$36.25
Weekly costs of tools and coolants		$215.77		$55.39
	$215.77			
	55.39			
Weekly savings using tool lubricant B	$160.38			
Yearly savings based on 52-week production on one machine	$8,239.76			

Yearly lubricant cost = 52 x $1.89 = $98.28

Thus, a total savings of $8,239.76 was made through an investment of only $98.28 for the correct tool lubricant.

ting or grinding operation:

1. Tool lubricant costs
   a. Cost per gallon
   b. Concentration used
   c. Consumption per week
   d. Cost of recharging machine
2. Production
   a. Pieces produced per day
   b. Pieces averaged per tool grind or wheel dress
3. Tools and wheels
   a. Original cost
   b. Average tool grinds or wheel dresses per day or week
   c. Number of possible regrinds or wheel dressings
   d. Cost of regrinding tools
   e. Diamond and wheel dressing cost
4. Labor and machine
   a. Direct labor
   b. Setup time
   c. Overhead or machine rate
   d. Maintenance costs (charging, cleanout)

The daily, weekly or monthly rates obtained from the sum of these factors should then be multiplied to determine annual costs. This, and not the initial cost of the fluids, is the payoff point.

Case History—A typical cost study compared two competitive water solubles in a high-speed machining operation on stainless steel (Fig. 3). The soluble with the higher initial cost gave the plant a yearly saving of $8239.76 per machine.

In another study, a water soluble was compared with an oil. This rough and finish reaming operation was initially set up for an oil. However, the water soluble proved to be more economical in the long run by $6880.00 per machine. In another operation, just the opposite might have proved true. It takes a cost study to find out.

But many plants still do their buying on a specification basis where the primary aim is to reduce the purchase price of their cutting and grinding oils. A program properly laid out will show that differences in performance in both production and laboratory can be measured in dollars and cents. Such studies will discover cost reductions that will far outweigh any difference in purchase price.

HEAT TREATING ALUMINUM I

Wrought Alloys

By W. A. ANDERSON
Aluminum Research Laboratories
New Kensington, Pa.

Forged aluminum parts are lowered into heat treating furnace

PURE aluminum is soft and ductile. When it is alloyed with other metals, it can be made strong and hard.

Alloys may or may not be heat treatable. Those which aren't cannot be hardened or strengthened significantly by thermal treatment. Those which can are strengthened greatly.

Why?—The solid solubility of alloying elements in aluminum increases with temperature. When a heat-treatable alloy is quenched from a temperature region of high solubility, the alloying elements are retained in a solid solution.

With aging, finely dispersed alloy phases precipitate, increasing the strength and hardness of the metal.

Solution heat treatment, aging, stabilization and annealing are important to the fabricator who wants to get maximum properties from aluminum alloys.

Annealing — During fabrication of most wrought alloy products, some strain hardening occurs. This may be due to cold working or to hot working below the recrystallization temperature of the metal. True, strain hardening increases the strength of the product, but its capacity for further deformation decreases.

The effects of strain hardening can be eliminated by annealing at temperatures where the worked structure recrystallizes.

Such annealing treatments are used at intermediate stages in fabrication and also as a final treatment for many semifabricated products.

Marked—The temper designation "-O" is given to alloys in the annealed condition. The -O temper also is the base for the production of strain-hardened tempers of alloys which are not heat treatable. They are designated by the letter "-H" and followed by numbers indicating strain hardening.

There are four standard tempers: -H12, -H14, -H16 and -H18, which are produced with increasing amounts of cold working. They have increasing strength and hardness in the same order. For some purposes, an extra-hard, -H19 temper may be produced with as much cold working as can be used practically.

Extra copies of this article and Part II on heat treating aluminum castings, which will appear next week, are available in quantities from one to three until the supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.

Part Way—The properties of the intermediate, strain-hardened tempers also can be produced by partial annealing of the -H18 or -H19 tempers. An annealing curve for commercially pure aluminum sheet in the -H18 temper is shown in Fig. 1. It shows that by heating in the range of 300 to 500° F, considerable softening is obtained without fully annealing the sheet.

Annealing conditions for the -O temper vary, depending on the alloy, the product and its fabrication history.

Pointers—Preferably, final annealing should be done on material subjected to a large amount of cold working—for example, the -H18 or -H19 tempers. Otherwise, a coarse, recrystallized grain size may be obtained. For the same reason, rates of heating should be rapid. Large grain size is objectionable because of the rough, orange-peel surface it gives on drawn and formed shapes.

Most cold-worked aluminum products can be annealed by heating to 650° F. Time of heating is

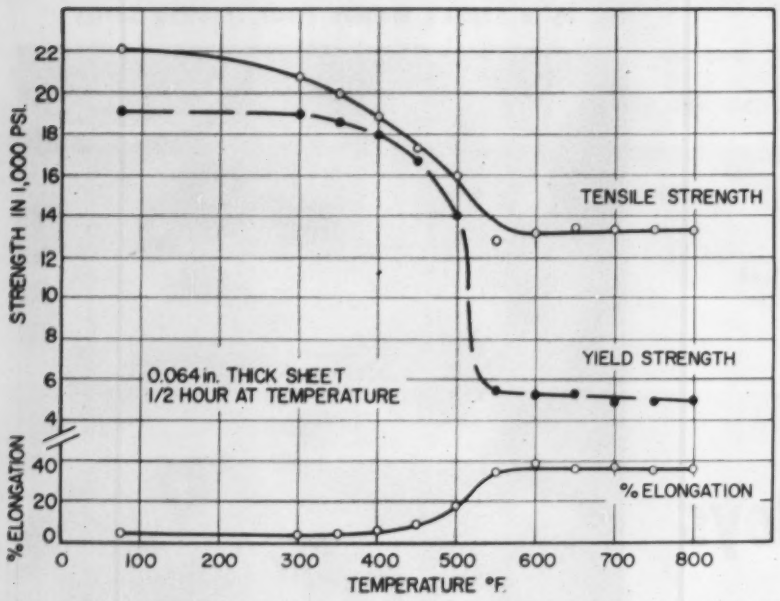


Fig. 1—How temperature affects annealing of commercially pure aluminum sheet from the -H18 temper

not critical. Generally, a few hours of soaking is used after the metal has reached furnace temperature.

Soaking times can be decreased by going to higher annealing temperatures, or lower annealing temperatures can be employed with longer times of soaking. Alloy products fabricated with minimum cold working or by hot working may require higher annealing temperature or a longer time than above.

How Fast—The rate of cooling from the annealing temperature is unimportant with alloys that are not heat treatable. Rates should be considered for heat-treatable alloys annealed above 650° F.

Here's Why: High temperature increases the amount of alloying elements in solution. This means an increase in the amount of precipitation during cooling and aging.

With medium or rapid cooling rates, this precipitate is finely dispersed and increases the strength of the alloy. With slow cooling rates, the precipitate is coarse. It adds little or no hardening.

Where maximum formability and stability are needed, the cooling rate should not exceed about 50° F an hour down to 500 to 600° F.

Stabilization—The strain-hardened tempers of aluminum-magnesium alloys which are not heat treatable tend to lose strength on aging at room temperature. This age softening continues for many years. It may reduce the yield strength of the stronger tempers by as much as 15 to 20 per cent.

Low - temperature stabilizing treatments in the range of 250 to 350° F are used in fabricating the strain-hardened tempers of these alloys to complete softening and to take advantage of the increase in ductility that results (U.S.P. 2,137,624).

Solution Heat Treatment — As shown for copper in Fig. 2, the solid solubility of alloying elements in aluminum decreases as temperature decreases below the eutectic.

As a result, alloys that contain elements in excess of the solubility limits at a given temperature tend to precipitate the excess as a discrete second phase. By close control, precipitates of such size and dispersion are developed which produce a remarkable increase in strength.

More Strength—Here's how this precipitation hardening process works: The part is first heated to a temperature above the solid solubility curve for the alloy in question but below that of its lowest melting phase. It is held at this temperature until it is homogeneous.

Then, it is cooled rapidly (usually by water quenching) to retain the added alloying elements in a supersaturated solid solution. Subsequent natural aging at room temperature or artificial aging at slightly elevated temperatures gives precipitation of the alloying elements and age hardening results (Fig. 3).

Recommendations—Table I gives the best temperatures for heat treating aluminum alloys. Close control is important; overheating may give eutectic melting. Underheating will reduce the strength

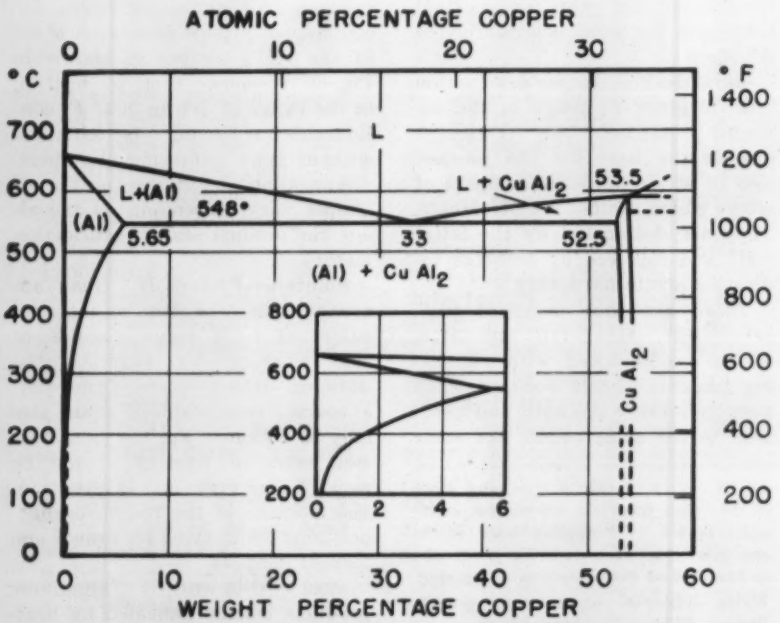


Fig. 2—Equilibrium relationship in the copper-aluminum system

of the alloy by decreasing the amount of elements in solid solution.

Heat-treating times are longer with massive sections. For sheet, soaking time is 10 to 30 minutes, while heavy plate and extrusions require several hours.

With alclad products (they have a thin surface coating of aluminum or aluminum alloy), soaking time should be kept to a minimum to prevent diffusion of alloying elements from the core into coating.

Quenching—The rate of cooling from the solution heat treating temperature affects tensile properties, resistance to corrosion and internal stresses.

Maximum strength and best resistance to corrosion usually are obtained by rapid cooling.

But internal stresses tend to be greater if the rate of quenching is rapid. Their magnitude and importance vary with the size and shape of the part. Usually, they are greater with large and complex sections.

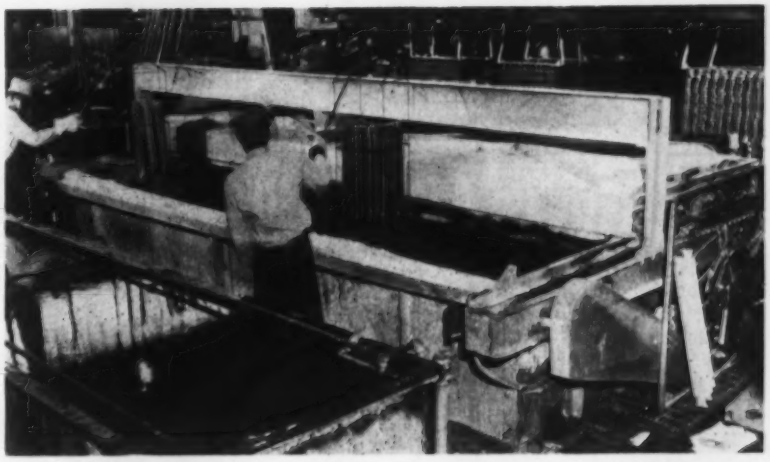
With sheet, plate and extrusions, it usually is possible to relieve and redistribute these stresses by stretching the product. In other cases, the only expedient is a decrease in quenching rate.

Practice is to quench from the solution temperature in room-temperature water. This may be by immersion, spray or fog quenching. Where stresses and distortion must be minimized, a milder quench in hot water or air blast is used.

Aging—In the as-quenched condition, the heat-treated alloys are a supersaturated solid solution and unstable. As a result, excess alloy tends to precipitate. This change increases strength, decreases ductility.

When this takes place over a period of time at room temperature, it is known as natural aging. Curves for alloys 2024 and 7075 are shown in Fig. 3. The yield strength of 2024 increases from about 20,000 to 40,000 psi in two days, then stays unchanged.

In contrast, the strength of 7075 increases indefinitely. The naturally aged condition of alloys such as 2024 (their properties vary little after several days of aging) is known as the -T4 temper. This is combined with the alloy designation as 2024-T4. A special temper designation, -W, is used for 7075; the time of natural aging is given in parentheses, as 7075-W (two months).



A batch of aluminum alloy tubes are uniformly heated to 920°F in Ajax salt bath. Temperature variation from inside to outside of charge is 5°F maximum

Cold Treatment—Natural aging can be retarded by refrigeration. Refrigeration frequently is used where forming is involved because of the good forming properties in the freshly quenched condition. Only limited forming is possible after age hardening has started.

Forming in the freshly quenched or refrigerated condition has another advantage: It eliminates distortion in the heat treatment and quenching of formed parts.

The extent that aging is retarded or delayed depends on the refrigeration temperature. At 32° F, age hardening is delayed 10 to 12 hours; at 0° F, aging is delayed a week or more. When parts get back to room temperature, age hardening goes normally.

Speed-Up—The rate of precipitation is increased by heating the quenched alloy. Known as artificial aging, such treatments are used to give higher strengths, higher

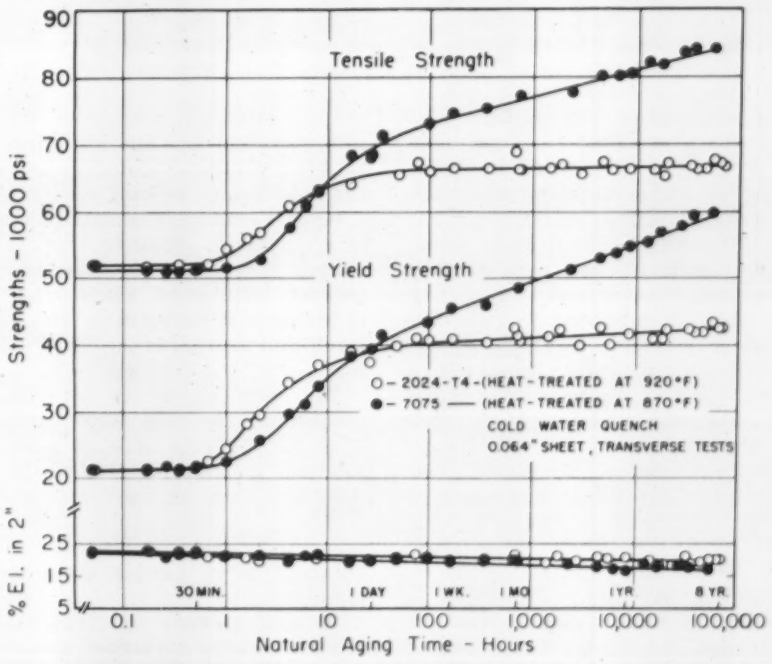


Fig. 3—Natural aging of alloys 2024 and 7075 after solution heat treatment and quenching

Table I—Conditions for Heat Treating Wrought Alloys

Alloy	Nominal Composition Si	Cu	Mg	Other	Solution Heat Treatment Temp. °F	Temper	Precipitation Heat Treatment Temp. °F	Time-Hrs.	Temper
2011		5.5		0.5 Pb, 0.5 Bi	940-970	—T4	320-340	12-18	—T6
							335-345	8-12 *	—T6
2014	0.9	4.4	0.4	0.8 Mn	925-950	—T4	315-325	16-20	—T6
2017		4.0	0.5	0.5 Mn	925-950		Room	48-96	—T4
2117		2.5	0.3		875-950		Room	48-96	—T4
2018		4.0	0.6	2.0 Ni	950-970	—T4	335-345	8-12	—T6
2024		4.5	1.5	0.6 Ni	910-930		Room	48-96	—T3 or —T4
							370-380	11-13	—T81
							370-380	8-10	—T84, —T86
2025	0.8	4.5		0.8 Mn	950-970	—T4	335-345	8-12	—T6
4032	12.5	0.9	1.0	0.9 Ni	950-970	—T4	335-345	6-10	—T6
6151	1.0		0.6	0.25 Cr	960-980	—T4	335-345	6-10	—T6
6053	0.7		1.3	0.25 Cr	960-980	—T4	315-325	16-20	—T6
6061	0.6	0.25	1.0	0.25 Cr	960-980	—T4			—T6
6062	0.6	0.25	1.0		960-980	—T4	345-355	6-10 *	—T6
7075		1.6	2.5	5.7 Zn, 0.3 Cr	860-930(1)	—T4	245-255(2)	22-26	—T6

* Optional.

(1) Extrusions, forgings and plate of 7075 must be heat treated within the temperature range of 860-880° F.

(2) Two-stage aging treatments may be employed for sheet or cold-drawn wire: 4 to 6 hours at 210° F plus 8 to 10 hours at 315° F, or 2 to 4 hours at 250° F, plus 2½ to 3½-hours at 325° F.

than those that can be obtained by natural aging.

The temper designation applied to artificially aged products is -T6. Conditions vary with the alloy. Usually, they are in the range of 4 to 24 hours at 250 to 400° F. The aging curves for alloy 2024 (Fig. 3) show the relationship of time to temperature.

Keep in mind that maximum strength comes from the right combination of aging time and temperature. Heating for a longer time or at higher temperatures gives lower strength.

Reheating—Heat-treated aluminum parts sometimes are reheated during forming and also during service. Here's what it does: Extreme reheating may change mechanical properties, resistance to corrosion or dimensional stability.

Generally, the higher the temperature, the greater the change and the sooner it occurs. This means there are definite limits of time and temperature to which alloys and tempers may be exposed.

Re-Solution—The effects of reheating are more pronounced in the -T4 temper than in the -T6 temper. In -T4, the first effect of reheating is to decrease the strength of the alloy. This is believed due to the solution of precipitate particles which are below the size limit for stability at the reheating temperature.

With the solution of these particles, the strains associated with them are largely lost. On further heating, there is new precipitation and growth of particles of a stable size. This increases the strength of the alloy.

Since maximum strength is due to a particular size and dispersion of this precipitate, heating beyond the time needed reduces strength.

Helps Forming—The initial loss in strength on reheating the -T4 temper varies with the alloy and product. With sheet, the decrease in strength is sufficient to give a significant increase in ease of forming.

The short commercial elevated temperature methods which produce these effects are called re-solution treatments (U.S.P. 2,-239,744). Forming must be done soon after re-solution treatment, because the material age hardens naturally after cooling to room temperature.

With alloys 2014 and 2024, re-solution reduces resistance to corrosion. It can be restored by artificial aging after forming.

Watch Heat—Reheating of the -T6 tempers reduces strength if the aging temperature is exceeded, or if the time of heating at lower temperatures is long. Permissible heating time and temperature varies with the alloy.

Generally, the properties of the Al-Zn-Mg-Cu alloys, such as 7075, are more affected by reheating than the Al-Cu-Mg or Al-Mg-Si alloys.

Reheating at 750 to 800° F, followed by slow cooling (50° F an hour) to about 450° F, will nullify the effects of heat treatment and aging. But production of -O temper material by this procedure is not recommended because the alloy will have lower formability than if annealed from the -H18 temper.

Furnaces — Electric, gas or oil circulating air furnaces are used. Molten salt baths, consisting of mixtures of nitrates and nitrites, also are used.

Close pyrometric control of temperature during heat treating and aging is essential. In gas and oil-fired furnaces, products of combustion should not come in contact with the load. Reason: Blistering and deterioration of the product may occur.

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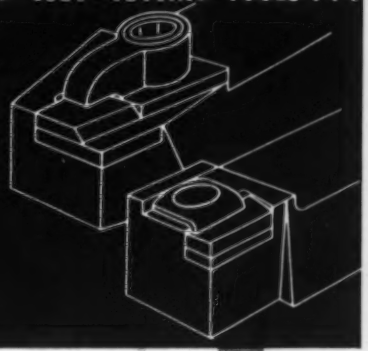
which permit speeds and feeds that would burn up yesterday's best, yet seem to run on and on with little sign of wear . .



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Frequently, CMP can do as much and more to help you save time and cut tool costs as modern tools themselves.

By processing cold rolled strip steel to restricted specifications, it often is possible to develop working qualities that will permit forming operations to be speeded up as much as 25% without increased tool wear.

Again, qualities may be imparted to the steel which will permit simplification of tooling, and even elimination of operations.

And, always, because of the customary dimensional precision of CMP Cold Rolled Strip Steel, there is more footage per coil . . . fewer coil replacements are required on automatic-feed operations . . . there is less tool wear . . . fewer stops for tool changes and assembly is speeded.

You are invited to use CMP's experience along this line with a view to developing restricted specifications to cut your end-product cost.

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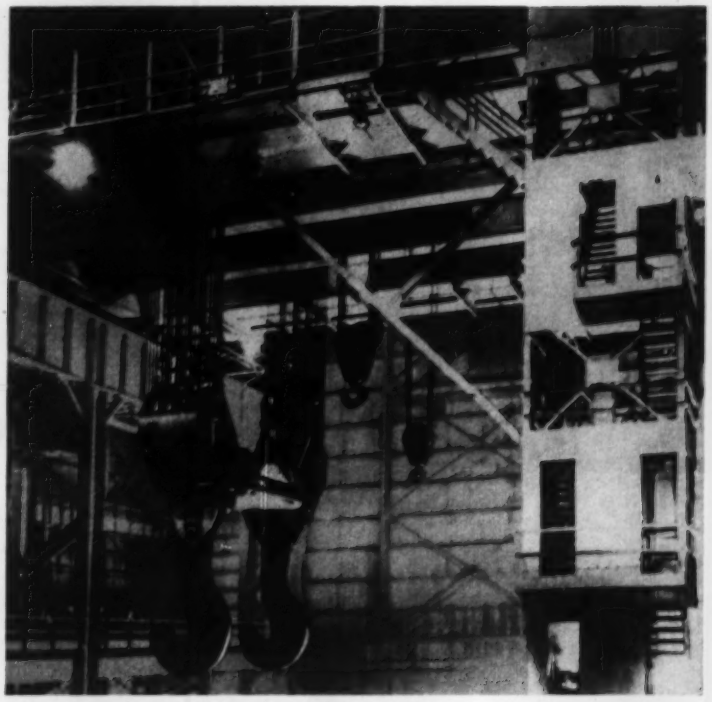
Safety devices are nothing new, but they're more important as industrial cranes are fitted for tomorrow's automatic factory. Steel mill practice is showing way



This 450-ton crane illustrates many safety features. Note the self-aligning equalizer block and the recommended stairway access to operator's cab

A Lesson in Crane Safety

INDUSTRY might well take its cue from the steel mills in the matter of safety in design and operation of cranes. Long faced with expensive downtime problems and extreme handling hazards, the steel industry has the know-how that other industries will have to acquire as automation creeps into more plants.

With this theme established, W. C. Bennett of Alliance Machine Co. told the 1955 Westinghouse Materials Handling Conference why it is that the steel industry has compiled enviable safety records in crane handling.

Most Important — Probably the most vital safety features are those designed to prevent ropes from breaking. They include safety ropes, load cells, equalizer bars, self-aligning equalizers, limit switches and special hook blocks.

Hoisting limit switches in steel mills are almost always of the power circuit type. They are actuated when the hook block lifts a weight on a rope attached to a counterbalanced arm on the switch. The hook block, as it nears the maximum usable height, trips the limit switch by lifting the weight.

The switch disconnects the motor from its control and reconnects it for emergency dynamic braking. The switch is so connected that the operator can lower from the tripped position, but he cannot hoist until the switch resets.

Added Safety—A patented hook block is sometimes used to back up the power circuit limit switch. This is a hook block with built-in compression springs which are capable of bringing the kinetic energy of the block and the load to a safe stop against the lifting beam with a safety factor of three remaining in the ropes.

This hook block is used with a circuit breaker that disconnects the power from the motor. Besides being nonresettable, this second switch forces the operator to call a maintenance man who then can discover why the first limit switch failed before he resets the second switch.

Slack Cable Check—On certain types of cranes where ropes are inside a column and not visible to the operator, a slack cable limit switch of the control circuit type is used to prevent snapping the ropes by suddenly picking up a heavy load after the drum, motor and brake wheels have acquired a high amount of kinetic energy. Warning lights can be used to indicate when the hook block is ap-

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Here's good news for users of aluminum fasteners.

Lamson & Sessions has now added "standard" bolts, nuts, screws and cotters of aluminum alloy to its famous full line of fasteners.

Henceforth the products illustrated above will be readily available. They come in a wide range of standard sizes, including machine screws down to No. 6 diameter by ¼" in length.

This means that users of aluminum bolts and nuts can now buy at competitive prices with the added advantages of fast delivery and service.

From now on it will pay you to insist on Lamson & Sessions aluminum fasteners—made by one of the world's largest fastener manufacturers.

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No matter what type or size of gears you require, it will pay you to check with Fairfield first. Take advantage, too, of Fairfield's helpful engineering services. *Your inquiry will receive prompt attention.*

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HERRINGBONE—(Fellows Type). Sizes from 1½" to 15".
SPIRAL BEVEL—Sizes from 16 pitch, 1½" dia., to 1½ pitch, 28" dia.
STRAIGHT BEVEL—Sizes from 16 pitch, 1½" dia., to 1½ pitch, 28" dia.
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ZEROL—Sizes from 16 pitch, 1½" dia., to 1½ pitch, 21" dia.
WORMS AND WORM GEARS—Worms to 7" dia. Worm gears to 36" dia.
SPLINED SHAFTS—Lengths to 52". Diameters from 1" to 6".
DIFFERENTIALS—10,000 to 300,000 inch pounds capacity.

Note: All sizes above are approximate.

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proaching the limit switch.

Self-aligning equalizers are another safety feature of steel mill cranes. They distribute the load on the ropes when its center of gravity does not coincide with the center line of the hook or when side loads are picked up.

Hot Metal Cranes—As an added feature, ladle cranes have two motors on the main hoist. Each motor has two power release brakes. Soaking pit cranes, ingot stripping cranes and all heavy-duty mill cranes have two brakes on the hoist. As with the ladle crane, each is capable of dissipating the energy required to bring the loaded hook to a complete stop from rated lowering speed.

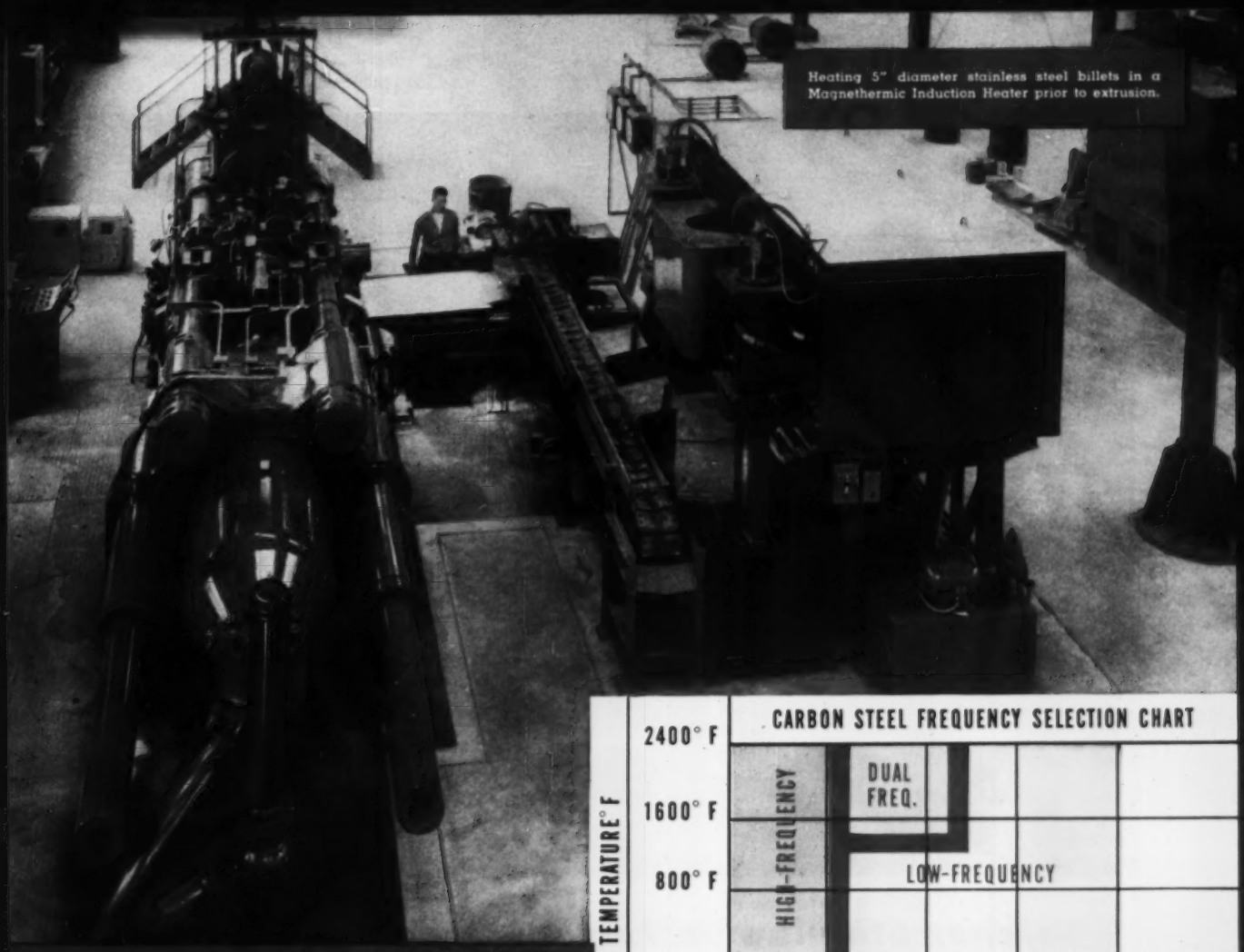
Electronic load cells are beginning to be used for weighing. They can be arranged to provide warning of severe overloads.

Travel Motion Safety — Cranes can be equipped for emergency dynamic braking when power is cut off or when the master control is either returned to stop or placed in the reverse direction. Slowdown limit switches are actuated when the limits of travel are approached.

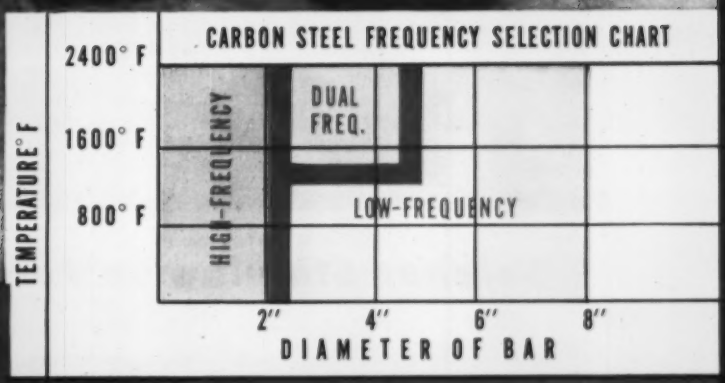
Spring-loaded and hydraulic bumpers are standard equipment. They are designed to absorb the kinetic energy of the loaded machine traveling at about half speed. Such things as track sanders, hydraulic brakes and signal devices are also optional.

Operating Safety — Devices for operator safety include heat resistant glass, air conditioned cabs and main line power cutoffs available both in the cab and close to the boarding point. Some bridges have boarding switches to interlock the undervoltage circuit of the bridge control panel by a palm-operated switch actuated by the person boarding the crane.

The maintenance man is protected by provision for padlocking all switches controlling power circuits in the "off" position. Every effort is made to have all conduit available from the foot walks, so that the erection of scaffolding or use of ladders is not required. Stairs are used if at all possible, but if clearance dictates use of ladders they should be provided with safety hoops.



Heating 5" diameter stainless steel billets in a Magnethermic Induction Heater prior to extrusion.



FORGE WITH INDUCTION HEATING

AND DO A BETTER JOB

With induction heat, a 5" diameter steel billet reaches forging temperature in less than five minutes. This rapid heating cuts operating costs by minimizing scale loss, maintenance costs, manpower and floor space. The equipment can be fitted into an automatic processing line, making billet pre-heating just one minor step in a forging operation. This is why modern production forging and extrusion plants are buying induction heating equipment.

Regardless of size of work or frequency, Magnethermic builds the equipment to meet your need. This company specializes in Induction Heating equipment, low-frequency or high-frequency, through 10,000 cycles. Write to Magnethermic for bulletin or information about your specific questions.

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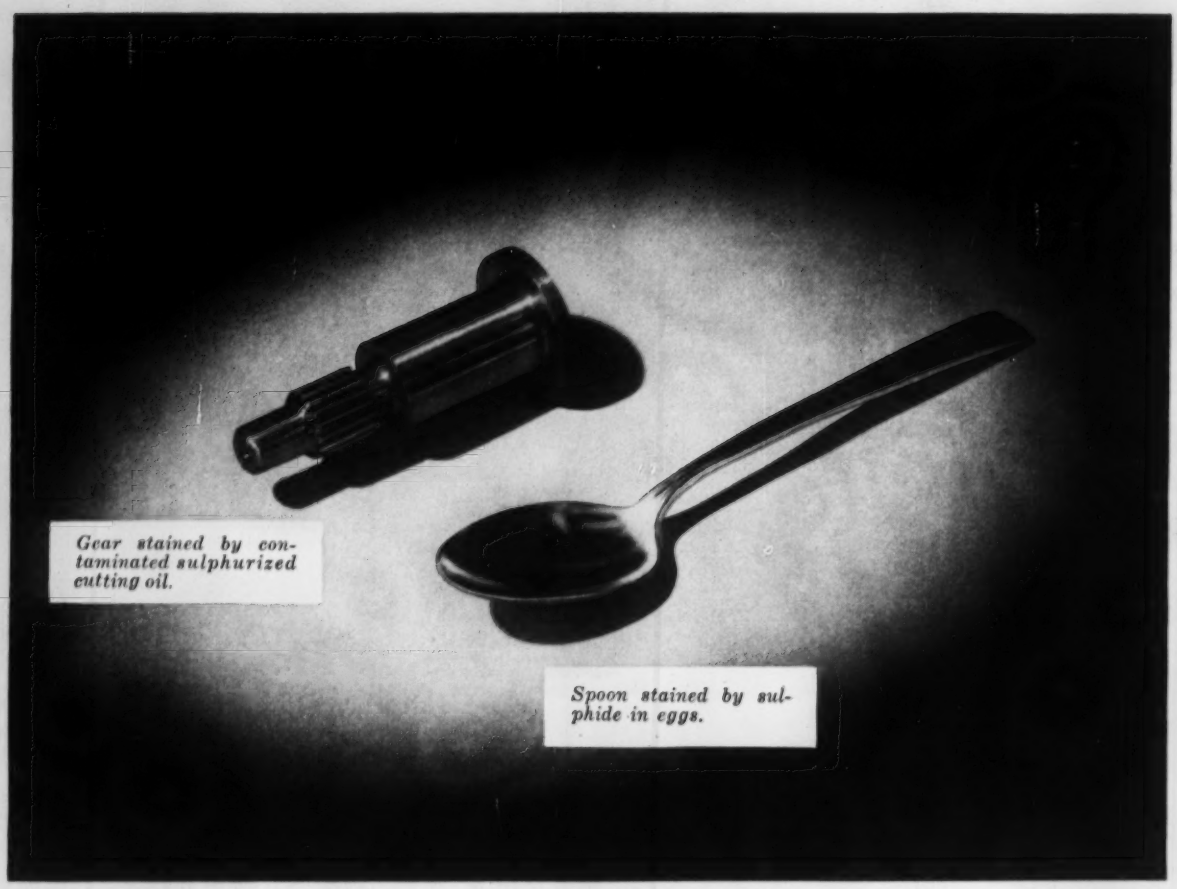

Sulphur Staining on Ferrous Parts is Harmless

Staining of machined ferrous parts caused by cutting fluids containing active sulphur is similar to the stains you find on your silverware. It has no adverse effects whatsoever on the finish, or characteristics of the metal. *It is not corrosion*, and according to automotive and military authorities, in no way affects service life.

Experience has proved that cutting fluids containing active sulphur provide far better performance when machining the tougher steels. Staining can only occur during very humid conditions or when water is allowed to contaminate the sulphurized cutting oil. A sample piece of metal will not stain in a cutting fluid free of water . . . but often it will the moment moisture is added.

The *important* factors to consider when selecting a cutting fluid are surface finish, production and tool life. Here is where a cutting fluid pays for itself. Ask to have "the Man in the Barrel", your Stuart Representative, help select that Stuart Oil that will produce the very best results under the conditions you will subject it to.

Further information on sulphur staining is provided in the D. A. Stuart Shop Note Book, Bulletin S-1. Write for your copy.

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Where to, Hydraulics?

Leakage control and standardization are needed to ease the pains of hydraulic growth

WHERE HYDRAULICS is going, and what it has to do to get there, set the tone for the Fabricating Machinery Hydraulic Conference in Detroit, May 17-18.

D. J. Davis, vice president-manufacturing of the Ford Motor Co., took up some of the big problems in his kickoff speech. Hydraulic applications are growing fast, he pointed out. That means we need more craftsmen with knowledge and skills in hydraulics who can operate and service complex batteries of machines.

Also needed: 1. Feed controls which will not be affected by temperature changes of oil or surroundings. 2. Simplified, practical controls to prevent feeding of tools beyond a predetermined torque or thrust. 3. Good, low-cost, nonflammable hydraulic fluids. 4. Improvements in sealing and piping to minimize leaks.

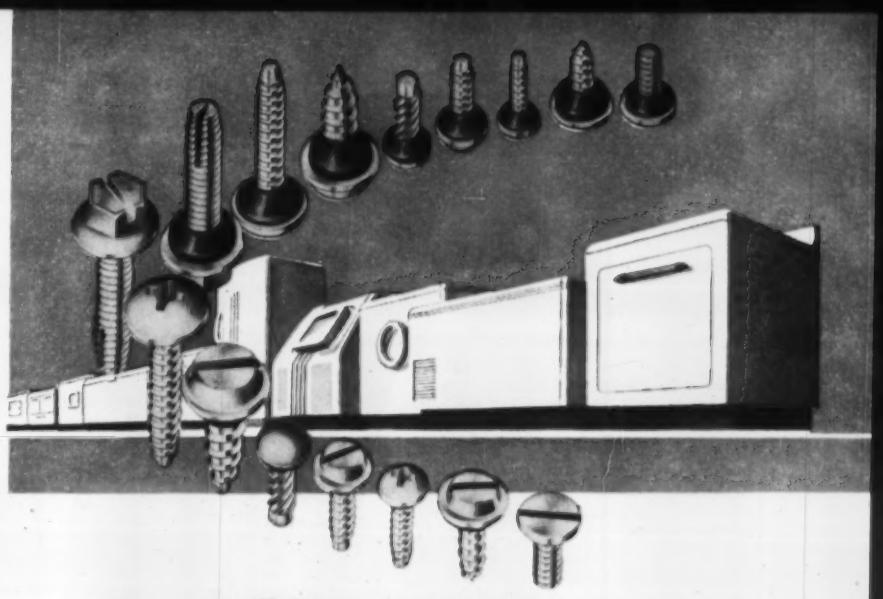
Leakage — "To give you some idea of the magnitude of hydraulic oil loss," said Mr. Davis, "Ford's Engine and Foundry Division alone used over 500,000 gallons of hydraulic oil during the last six months of 1954. Much of the oil lost from leakage makes its way into our plant sewers. To prevent stream pollution, we have invested over $1 million for oil-removal facilities."

Leakage still is a major housekeeping problem. Slippery floors require repeated cleaning, and oil-soaked floors increase fire hazards.

Standardization—This is another area in which hydraulics stands to gain. There has been some standardization in engineering and installation practices, but industry would benefit further if dimensional standards were developed for commonly used devices. Several manufacturers make interchangeable valves, a step in the right direction.

At Ford, said Mr. Davis, efforts are being made to establish standard mounting and porting dimensions for hydraulic cylinders. Manufacturers of hydraulic equipment are co-operating.

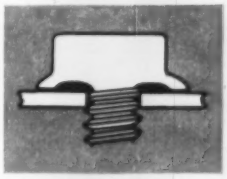
Ahead—What research holds for



New Tuff-Tite* Fastener

Is Leakproof—Holds Securely

—Protects Surfaces



Neoprene washer trapped under head seals hole—acts as cushion.

Tuff-Tite is a new multi-purpose fastener that gives tight, leakproof seating without cracking or chipping porcelain enamel and other fine finishes. It also dampens vibration by acting as a shock absorber and eliminating squeaks and chatter.

All this is accomplished by Tuff-Tite's one-piece metal head and assembled neoprene washer. When tightened, the neoprene is trapped and controlled by an undercut in the washer head. The neoprene is forced into the hole and around the threads to provide a cushion which protects the surface and forms a watertight and airtight seal.

Tuff-Tite fasteners are used for quick, secure, leakproof fastening of metals and plastics. They are available as tapping screws, thread cutting screws, drive screws, machine screws, stove bolts, wood screws and special fasteners. They are made of carbon, alloy and stainless steel, aluminum, brass and other metals in a variety of head styles.

To learn more about how Tuff-Tite can give you leakproof surface protection with economy, use the coupon below.

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hydraulics is tied in closely with machinery development and electronics. The extremely heavy presses developed for aircraft forging hold promise for other industries. They open possibilities for one-piece construction of products that are assembled today.

Electronic computers to speed up calculations and analyses can save a lot of time consuming and expensive experimentation in hydraulics, helping to get new ideas into production.

Some other conference highlights:

New Fluids—Water-soluble fire-resistant fluids (oil-in-water and water-in-oil emulsions) probably will be limited in their application to working pressures below 300 psi to insure satisfactory performance. One user reported fair results with a water-soluble type in a hydraulic welding application in the 300 to 400 psi operating pressure range.

Leak Control — A large press manufacturer successfully welds pipe to flanged connections to produce a no-leak joint. A pickling operation following welding removes the scale which may have formed on the pipe's inside diameter during welding, and piping runs are thoroughly stress relieved after welding.

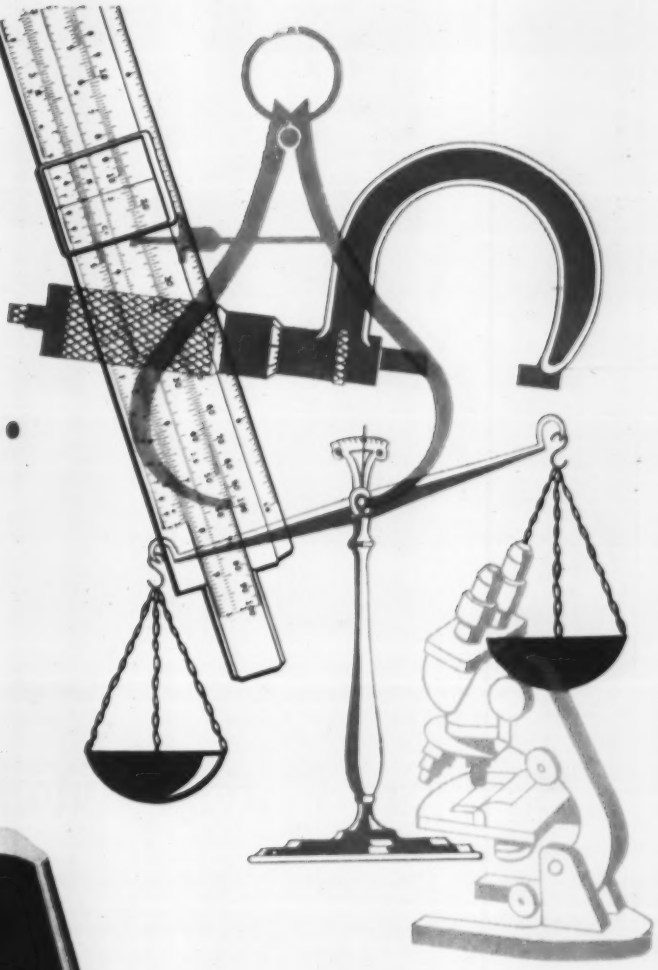
Silver-soldered joints also were cited as a good way to control piping leaks. Induction heating was recommended as the ideal method for soldering with minimum distortion of the fitting.

The conference was attended by nearly 150 design, maintenance and service engineers, representing 88 manufacturers of metalworking machinery and 15 suppliers of hydraulic components and materials. It was sponsored by Vickers Inc., Detroit.

Stress at High Temperatures

Many times the engineering use of metals at elevated temperatures involves periodic changes in temperature or stress or both. A *Symposium on the Effect of Cyclic Heating and Stressing on Metals at Elevated Temperatures* which covers these situations has been published. The publication is available from the American Society for Testing, 1916 Race St., Philadelphia 3, Pa., at $3 each.

* by any measure...



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If bearing units were sold solely on a performance price tag—so many cents per so many hours of efficient performance—SEALMASTER Bearing Units would unquestionably rate the "best buy" tag. By any measure; design features, quality of materials, scientific manufacturing processes, quality control, engineering cooperation, completeness of line, or geographical distribution, SEALMASTER is second to none as a manufacturer of one of industry's most vital components. When you demand the SEALMASTER trademark on the bearing units you buy, you can be certain you are getting full measure for every dollar you spend.

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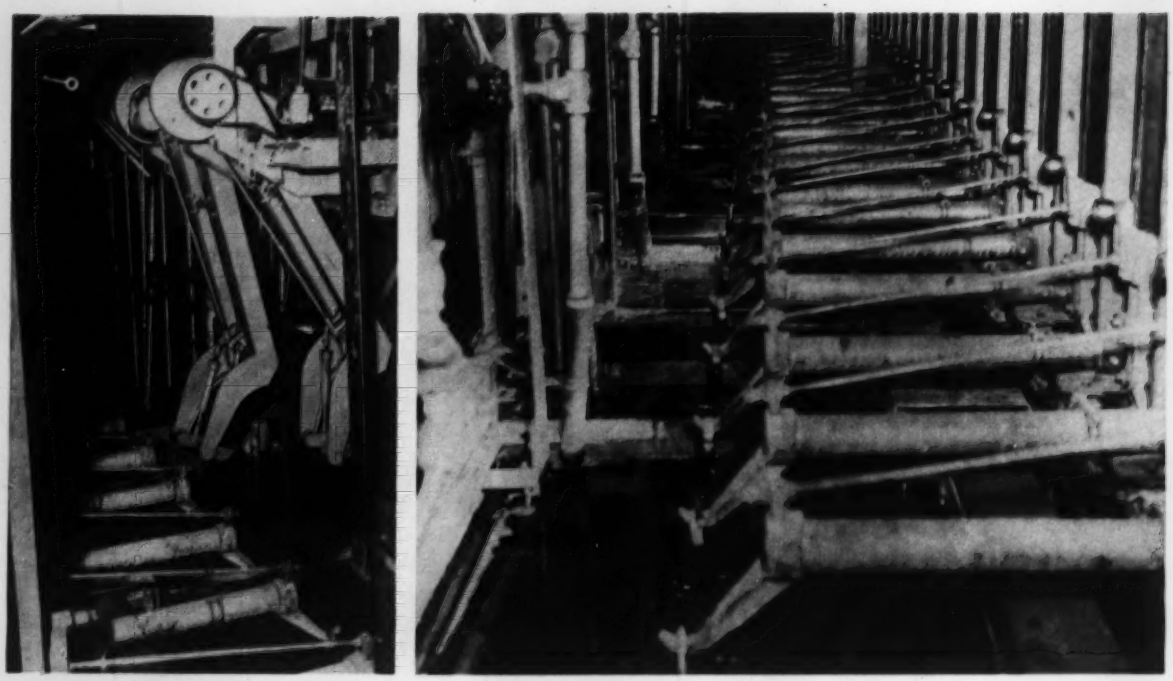


Swinging arms at left are the loading-unloading mechanism on the plating machine. Below them (close-up shown in photo on right) are the horizontal arms that carry racks through the solutions

Hardware Plating: Automation Takes Over

PLATING die-cast refrigerator hardware is big business for the National Lock Co., Rockford, Ill. To keep up with it, that company recently put $300,000 into a Hanson-Van Winkle-Munning plating machine.

Here's what the company got for its money: Automatic conveying, automatic loading and unloading, automatic by-passing, automatic rack stripping, a safety halting device and fast and simple control of plating times, cycles and sequences.

What It Means—With the new machine, plating capacity has tripled. Between 7000 and 20,000 parts are plated during an 8-hour shift. That's 200,000 workpieces a month on the present round-the-clock work schedule. Steel parts as well as diecastings are plated.

Plating quality, especially on larger workpieces and in recessed areas, has improved. Less metal used and less handling add up to plating at lower cost. The services of a loader-unloader and several rack strippers are no longer needed, which adds up to about $20,000 a year in labor costs saved.

Conveying—Copper, nickel and chromium plating are automatic. The machine can perform all three operations in sequence, or any one or two of the three. Plating cycles and immersion times may be easily varied and controlled. This feature assumes special importance because changes are made several times in a typical day.

Transfer mechanisms load and unload racks on the conveyor. Loading and unloading mechanisms, similar in design, are alongside each other between the end of the chromium plating line and the beginning of the copper plating cycle. They move reciprocally between the plating machine and an auxiliary conveyor and are synchronized to load and unload racks while the carrier arms of the plating conveyor are in a dwell or down position. Speeds are regulated, and loading and unloading are sequenced. A rack is delivered to the plating conveyor and one is taken from the same machine every 38 seconds during the normal cycle.

By-Passing — Cathodic cleaning, copper strike, copper plating, acid dip, nickel plating and chromium plating are set up for by-passing.

A flipper at a tank to be by-passed actuates the by-passing movement when it contacts a roller on the carrier arm. The arm then stays aloft during the normal lowering cycle.

Stripping — Plating of copper-nickel-chromium is done without reracking. Possible contamination of the copper and nickel solutions by chromium has been overcome by electrolytically stripping the racks of chromium following unracking of the plated parts.

Current for the electrolytic cleaning baths is supplied by a 6000-amp generator. A 7500-amp unit supplies the copper, nickel and chromium plating baths. Generators are in an air conditioned room above the installation.

To remove fumes, an exhaust system handles 51,000 cu ft of air a minute, or the equivalent of six air changes.

Rinsing — The company has been able to practically eliminate staining by introducing three rinses after chromium plating, besides a re-

claim rinse. Parts are given a final rinse of de-ionized water in a spray cabinet while on the auxiliary conveyor, then are hot-air dried.

Cathode rails are mounted above and at the back of all electrified tanks. Work enters the plating bath electrified. This means good adhesion and a high quality finish.

The copper strike bath is continuously filtered to lower the chances of roughness in the plate that serves as a base for the other deposits.

Control — Control instruments regulate all three plating baths and significant cleaning and rinsing operations. Manual controls for starting and stopping all motors in the system are housed in a panel near the load station. This panel also contains an electric control for varying immersion time.

One control innovation and safety feature is a trolley stop-cord that runs around the edge of the plating conveyor. With it, an operator can stop the conveyor from any place on the machine.

Purity—De-ionized water is used for all final rinses and for making up all plating solutions. The acid dip preceding nickel plating was found to be extremely sensitive to traces of oil on the surface. An overflow weir on the tank skims oil from the bath's surface.

Each part coming off the machine is inspected. Rejects are few, and most blemishes can be touched up by buffing.

To test adherence, all plated diecastings are baked for 1 hour at 300°F. It's necessary since many parts are painted after plating and must withstand the heat of a paint curing process without blistering.

How National Lock Co.'s Automatic Plater Works

1. Racking: Polished, buffed and degreased parts are placed on plating racks as they travel along on overhead auxiliary conveyor. Four girls can load 95 racks an hour. Up to 60 small pieces, and 8 to 16 refrigerator handles, can be placed on a rack.

2. Automatic Loading: When racks reach the loading station, they are transferred automatically from the auxiliary conveyor to the plating conveyor.

3. Copper Plating: Times are typical, but vary according to process requirements.

1. Soak Cleaning	3 min. 35 sec.	9. Cold Water Rinse	5 sec.
2. Warm Water Rinse	5 sec.	10. Copper Strike	1 min. 35 sec.
3. Cold Water Rinse	5 sec.	11. Copper Plating	13 min. 35 sec.
4. Anodic Cleaning	35 sec.	12. Reclaim Rinse	5 sec.
5. Warm Water Rinse	5 sec.	13. Warm Water Rinse	5 sec.
6. Cold Water Rinse	5 sec.	14. Cold Water Rinse	5 sec.
7. Acid Dip	35 sec.	15. Cold Water Rinse	5 sec.
8. Cold Water Rinse	5 sec.		

4. Nickel Plating:

1. Acid Dip	5 sec.	4. Reclaim Rinse	5 sec.
2. Cold Water Rinse	5 sec.	5. Cold Water Rinse	5 sec.
3. Nickel Plating	13 min. 35 sec.	6. Cold Water Rinse	5 sec.

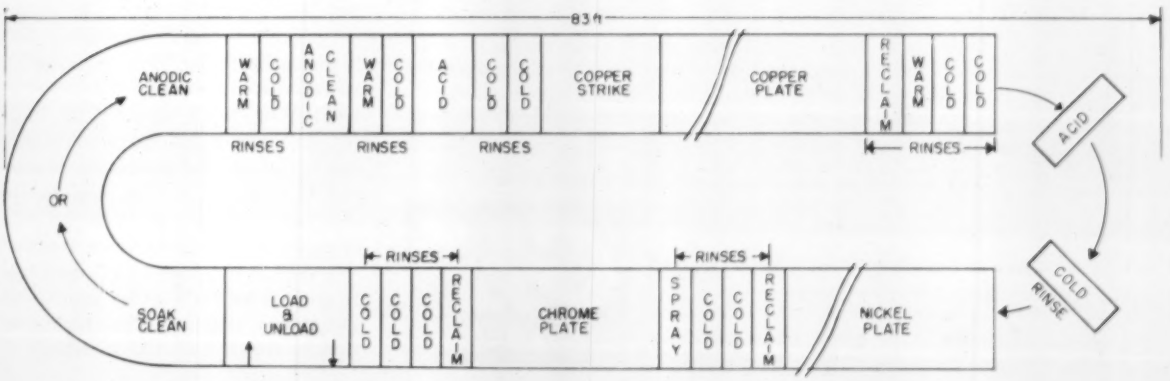
5. Chromium Plating:

1. Spray Rinse	5 sec.	4. Cold Water Rinse	5 sec.
2. Chromium Plating	2 min. 35 sec.	5. Cold Water Rinse	5 sec.
3. Reclaim Rinse	5 sec.	6. Cold Water Rinse	5 sec.

6. Unloading: Racks are transferred automatically from the plating conveyor to the auxiliary conveyor. Unloading and loading stations are 18 in. apart.

7. Post-plating: Racks are conveyed through a waterspray bath. After rinsing, they pass through a drying oven, receiving blasts of hot air. Oven temperature is between 180 and 200°F.

Parts are unracked while the racks remain on the monorail conveyor. The racks are later stripped, washed, dried and returned to the racking station.



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FEATURING:

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- Lowest Headroom
- "CM-Alloy" Flexible Link Chain

CAPACITIES: from ½ to 1 ton. Single and 3 phase. ¼ ton model weighs only 51 pounds.

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Built to serve you without costly maintenance

Lodestar is the first truly "heavy duty" version of the small electric hoist. The CM Lodestar is designed to operate without costly maintenance or interruptions in your work schedules. The initial cost is practically your only cost with a Lodestar... an extremely low cost indeed!

WRITE US or call your CM distributor for literature, prices and quick delivery from stock.

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CM HOISTS AND CHAIN

Custom Tools Cut Costs

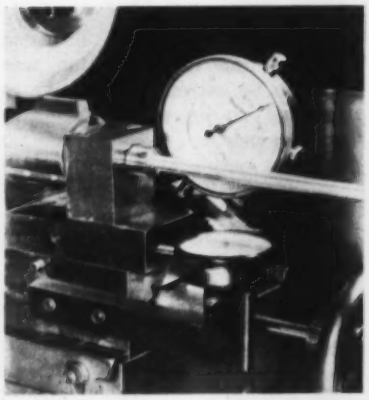
Here is a thread cutter that takes over three times more regrinds than ordinary mills

A CARBIDE-INSERT thread mill cuts over 1000 linear feet of internal pipe threads between grinds, or 30,000 ft during its life, at General Electric Co., Pittsfield, Mass.

The inserts, tipped with Carboloy-grade 350 carbide, are fastened into the steel body of the cutter by tapered pins. H-bond diamond wheels of Nos. 100 and 200 grit are used to rough and finish grind the thread form on the insert.

Grinding—The inserts are positioned for grinding in a fixture which uses a hand-rotated, cylindrical insert holder, a horizontal dial indicator, a sine bar and vertical dial indicator.

Using the horizontal indicator, the operator positions the first tooth to be ground, so all inserts in a set duplicate each other. The



GRINDING CUTTER INSERT
. . . in precision lead spacing fixture

sine bar and vertical indicator denote the needed advance of the insert holder when changing the grinding position from one tooth to the next. The sine bar angle is such that tooth spacing is indicated by an exact multiple of one revolution of the indicator needle.

The same method is used to resharpen inserts. Because of the way the teeth wear, this method requires less removal of material than face or flute grinding. About 30 radial regrinds can be made during the life of the inserts.

Vanadium-Alloys Steel Company

where the going is

hot and heavy

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DIE STEELS for HOT WORK

Hotform—*5% chromium type.* For die casting dies, dummy blocks, extrusion dies, backer blocks, mandrels, hot piercers, hot forging dies. *Strong, tough, resists heat checking.*

Forge Die—*14% tungsten type.* For forge die inserts, extrusion dies, gripper dies, hot pressing dies, dummy blocks, hot piercing tools. *Resists softening; stable under impact.*

SC Special—*14% tungsten type plus increased carbon.* For hot forging dies and punches, extrusion tools, hot forming rolls.

Marvel—*9.50% tungsten type.* For brass forging dies, extrusion press tools, nut dies and piercers, hot shears, hot swaging dies.

Hotpress—*9.50% Tungsten type* with low chromium for added toughness. For hot press dies, extrusion press tools, upsetter machine dies.

WW Hotwork—*12% tungsten, 12% chromium type* for unusual heat and wear resistance. For brass-casting dies, die casting nozzles, special extrusion dies.

Red Cut Superior—J Temper *18% Tungsten High Speed Die Steel.* For hot press dies for copper and brass, extrusion dies, hot and cold trim dies, punches, heading dies. *High hot hardness and wear resistance.*

VANADIUM-ALLOYS STEEL COMPANY

Manufacturers of First Quality Tool and Die Steels

Latrobe, Pennsylvania

COLONIAL STEEL DIVISION • ANCHOR DRAWN STEEL CO.

In Canada:

Vanadium-Alloys Steel Canada Limited, London, Ontario

NOW ...Wire of High Finish for Electroplated Products in Many Shapes & Sizes

Bright, Smooth No. 3 Finish takes Plating Beautifully—Adds Eye-Appeal to Your Products

Continental's new technique for producing #3 finish flat and special shaped wire offers you a range of standard and special wire shapes with a satin smooth finish for electroplating purposes. Previously, only flat wire with a surface suitable for high polish electroplating was obtainable . . . but now from Continental you can specify #3 finish in flat, square, rectangular, oval, and other shapes on inquiry, in practically any size, temper, and analysis in low carbon and medium low carbon steels. Here is extra "eye-appeal" for moldings, product trim, or wherever a formed plated wire component is required. Send us a blueprint of your part, or mail the coupon below for complete information without obligation. Telephone or write today.

SPECIALISTS IN WIRE
FOR OVER HALF A CENTURY

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STEEL CORPORATION
KOKOMO, INDIANA

PRODUCERS OF:
Manufacturer's wire in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

FILL OUT AND MAIL TODAY

Gentlemen: Please send us complete information concerning the new Continental #3 Finish Wire for Electroplating.

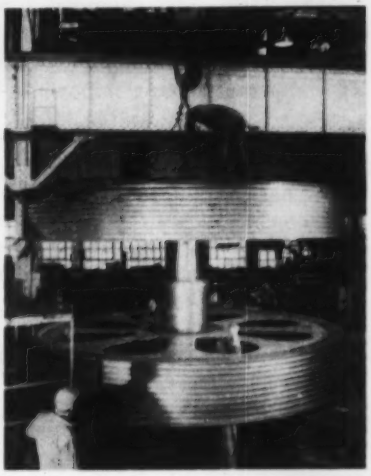
NAME_____
TITLE_____
FIRM_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

Operation Frostbite

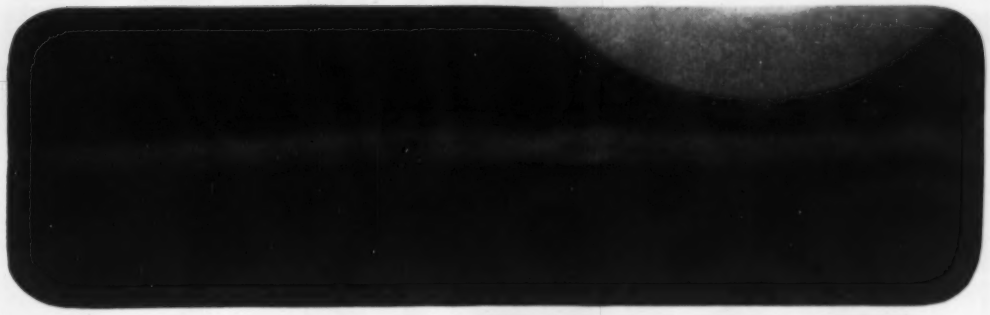
SHRINKING a 7½-ton shaft enough to slide two 20-ton sheaves on it took a ton of dry ice and 85 gallons of alcohol. Five hours in that bath at U. S. Steel's American Bridge division, Ambridge, Pa., was all it took to make the shaft contract the necessary few-thousandths.

Then the action began. Last minute micrometer readings were taken to make doubly sure the sheaves would fit. With hairbreadth clearance, cranemen lowered the trunnion into the center hole of the first sheave. Seconds later, the second sheave was lowered over the top of the trunnion. The expansion of the trunnion on warming to room temperature made an almost inseparable bond between shaft and sheaves.

Four of these sheaves are being fabricated for a double-track lift bridge spanning Cleveland's Cuyahoga river. The New York Central Railroad is the customer.



Welding builds it faster, lighter and safer...



and RADIOGRAPHY checks each weld.

It swims. It climbs. It fights. It's tough and strong. For, from stem to stern, this L. V. T. is welded.

Welding saves precious weight and countless man-hours in construction. It avoids the rivets and bolts which become as lethal as shell fragments under shock.

With Radiography checking for soundness, welding continually finds new work to do—solves problems that would make jobs like this L. V. T. virtually impossible.

So weld shops, with small operations or large, are finding radiography valuable both for building reputations for good work and for expanding into new fields. If you would like to explore how Radiography can help you increase your business, get in touch with your x-ray dealer. He'll gladly talk it over.

RADIOGRAPHY

... another important example of photography at work

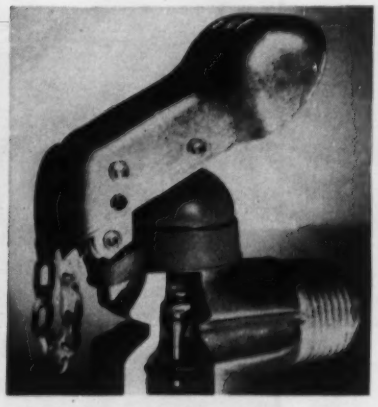
Kodak

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N.Y.

Here's why Ansul extinguishers give you faster, more dependable fire protection!

READY for instant action under the most severe exposure conditions.

WEATHER-TIGHT NOZZLES made of aluminum and stainless steel, can't rust. Neoprene cap and oil-impregnated washers keep out moisture.



PUNCTURE PIN. In this aluminum housing a stainless steel pin pierces the gas cylinder that supplies the propellent power for the dry chemical.

PATENTED NOZZLES. Straight or fan stream, the hazard determines which is installed. An Ansul exclusive for more effective fire control.

FIELD RECHARGING. Just 4 minutes after a fire is extinguished your Ansul unit can be recharged, ready for action. No special tools are needed.

The pictures on this page tell half a story. The complete story includes Ansul's facilities for training your personnel in the science of fire control and prevention. Experience has taught us that *complete* fire protection demands *both*—fast, dependable equipment and trained personnel to man that equipment. Ansul can provide both. Get in touch with your local Ansul man, he has the complete story about *complete* fire protection.

Write Ansul for your copy of New Fire Equipment Catalog.

Call the ANSUL MAN!

Get in touch with your local Ansul man through the "yellow pages," or write direct to ANSUL CHEMICAL COMPANY, Fire Equipment Division, Dept. F-131, Marinette, Wisconsin.

ANSUL

Computer Takes Guesswork Out of Machining

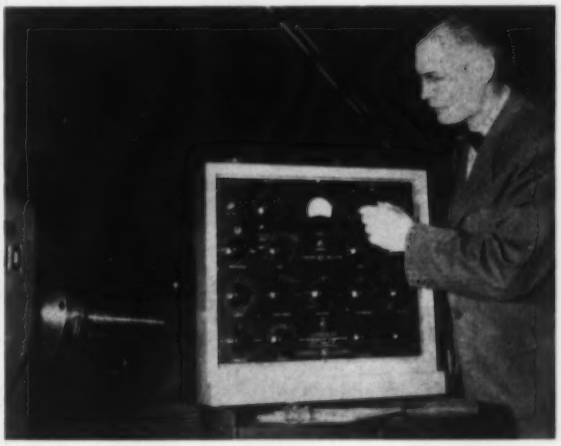
A new electronic computer solves production line machining problems in less than 2 minutes. With this instrument, a methods and service man can quickly determine the correct set of conditions for machining a job.

Example: A lathe was turning bar stock at 175 fpm, using 0.0125 in. feed and removing 3.1 cu in. of material a minute. All cutting conditions were determined and the facts were fed into the computer. It came up with a feed of 0.025 in. and a speed of 475 fpm. Tool life was lengthened and the appearance of the surface was improved. Rate of cutting was increased to 16 cu in. a minute.

The self-powered analog unit will consider 14 operational variables. They include the alloy, its microstructure, its surface condition and hardness; cutting fluid; tool material; feed; depth of cut; flank wear land; tool profile; type of tool; number of cutting edges; cutting speed; and tool life. The unit can be fed information on any 13 variables and come up with the 14th, the answer.

It also will consider five variables which affect the motor horsepower required to do a job and come up with the answer from information on four of these. They are: Feed, depth of cut, cutting speed, material to be cut and the horsepower required.

The computer was developed by Dr. W. W. Gilbert, formerly of the University of Michigan, now with General Electric Co.'s Manufacturing Services Division, Schenectady, N. Y. Data on which the computer is based came largely from General Electric's experience in machining. The unit has been field tested for more than a year in GE's plants.



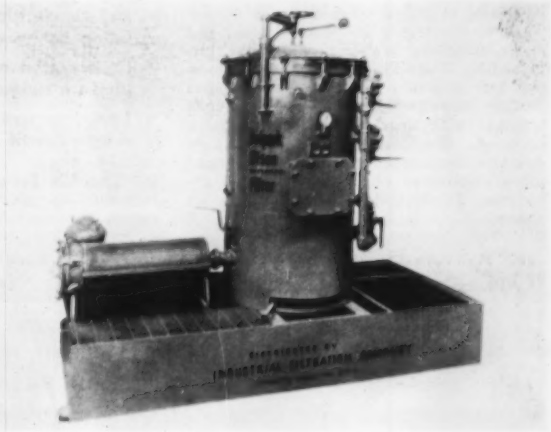
Answers provided by the computer are based on the use of those feeds, depths of cut, proper grades of carbide and tool geometry which will result in normal cutting edge failure. *Write*: Carboloy, Department of General Electric Co., Detroit 32, Mich. *Phone*: Jefferson 6-9100

Diatomaceous Earth Filter Is Self-Cleaning

Screen elements of the Delpark-Olson superflow filter are precoated with diatomaceous earth. This forms a cake through which the fluid passes. The earth does not affect additives present in most oils and processing fluids.

Cleaning is automatic and is done in 1 to 3 minutes by back washing. Liquid is forced through the tubular filter elements from the inside. The earth cake is knocked off and allowed to settle to the cone of the filter. Agitation in the cone prevents packing of the sludge. Cleaning out is done without emptying the filter and is fast, clean and easy.

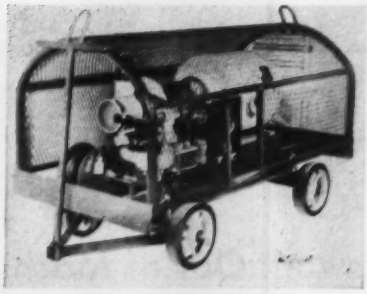
The unit is particularly applicable to coolants, cutting oils, test stand oils, hydraulic oils, industrial cleaning solvents and chemicals. Capacities range to 175 gpm. *Write*: Dept. 0-297, Industrial Filtration Co., Lebanon, Ind. *Phone*: Lebanon 1877



NEW PRODUCTS and equipment

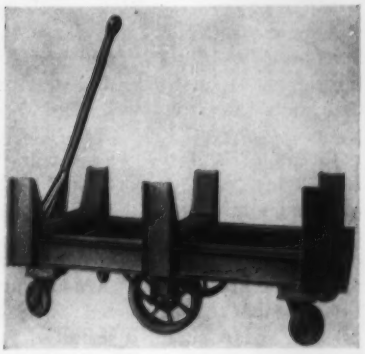
Mold Dryer

Portable and automatic, it can be put into operation on a mold in less than 5 minutes. It occupies a 3- x 6-ft area. The machine can dry a flask mold in one sixth the time required by infrared or charcoal systems. It burns any commercial gas and requires no vents, smoke stacks or special outlets. *Write:* Milwaukee Shipbuilding Corp., Heat Transfer Div., Milwaukee, Wis. *Phone:* Broadway 1-9880



Bar Stock Carrier

This all-welded, steel unit is designed for floor moving of heavy bulk loads of raw materials or finished products. It is 4 ft wide, 8 ft 6 in. long. Two rubber-tired wheels are 12 in. in diameter. Four smaller wheels with casters and rubber tires provide easy maneuverability.



The carrier is available in capacities from 1 to 20 tons. *Write:* Rack Engineering Co., 190 Sixth St., Connellsville, Pa. Phone: 3080

Arc Welding

Designed for welding chromium-moly steel, a new arc system minimizes the need for preheating and heat treatment after welding. It uses a group of chromium-moly electrodes whose weld deposits exhibit good stress-rupture characteristics over a wide temperature range.

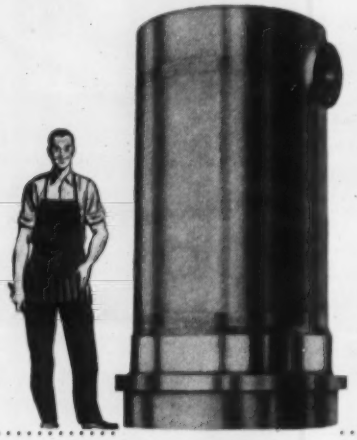
Important applications include the welding of power piping and the fabrication of high-pressure boilers. *Write:* Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y. *Phone:* Oxford 7-0800

Reversible Motor

Designed for use on door operators, machine tools, cranes and hoists, it has a built-in, five-stud terminal board with a reversing connection diagram on the inside of the terminal box cover. There is no internal relay to delay the answering action of the motor when polarity is reversed.

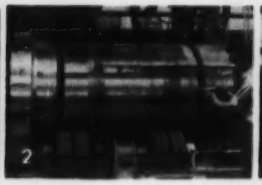
A compact, high-voltage capacitor helps start and reverse heavy loads. The motor can support

Need Large Hydraulic Cylinders?



BUILT TO REQUIRED SIZES AND TOLERANCES BY

TITUSVILLE FORGE



Hydraulic cylinders combining the advantages of thoroughly hot worked steel and clean automatic welding are being furnished by Titusville. Such cylinders insure the user of better physical characteristics (hollow forged shell and flanged sections together with upset forged top or dome sections), freedom from leakage under pressure because of porosity and the complete elimination of costly repairs or rejections. Fabrication is shown in photos above.

1. Hollow forging for shell section being hot worked on mandrel.
2. Hollow and upset forgings assembled for automatic welding.
3. Complete welded cylinder being rough turned in 80" engine lathe.

Let Titusville Forge build your hydraulic cylinders—to your most exacting requirements.

Struthers Wells

STRUTHERS WELLS CORPORATION

TITUSVILLE FORGE DIVISION

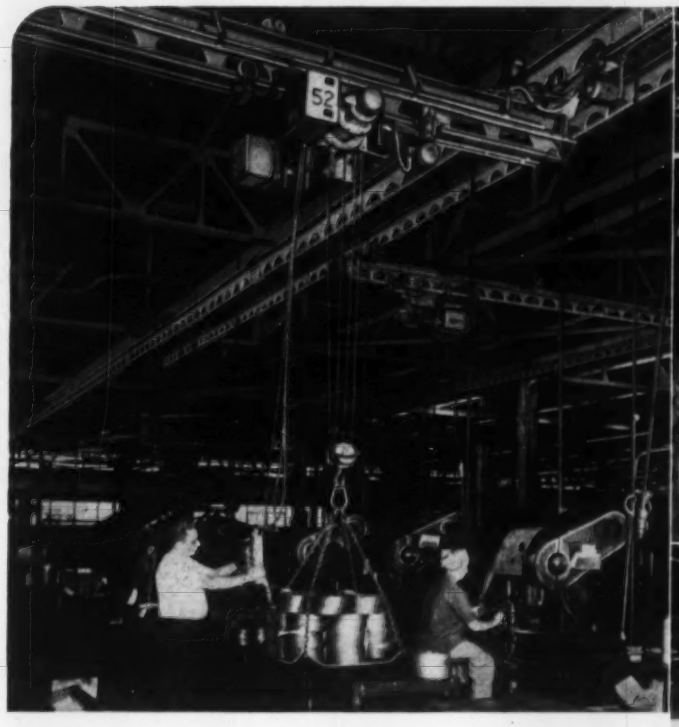
TITUSVILLE, PA.

PLANTS AT TITUSVILLE, PA., and WARREN, PA.

Offices in Principal Cities

CRANES *SPEED* PALLET-HANDLING

Store More—Eliminate Congestion—Cut Maintenance—Save Floors



Pallets loaded with motor stator laminations are easily lifted and moved with these floor-operated Tramrail cranes. Note that the entire area is jam-packed, with no lost aisle-way space. The ease with which any loaded pallet can be picked up and handled to awkward-to-reach places is a distinct advantage.

Pallets with 32 100-lb. kegs of nails are piled high in storage with the cab-operated Tramrail crane and open-side pallet lift.

THERE'S no height limit when stacking palleted materials with Tramrail cranes. 20 ft.—30 ft.—40 ft. or higher are easy. Your materials and building are the only limiting factors.

Often 50% and more materials on pallets can be stored in a room served by overhead cranes. Narrowing of some aisles, elimination of others, plus higher and closer piling make the difference.

Pallet loads are moved safely and speedily overhead where the path is always clear and unobstructed. Placing this handling job near the ceiling, reduces floor congestion and frees much of it for other purposes.

Maintenance costs for Tramrail cranes are extremely low, usually only a few percent of that for power-operated floor trucks. No engines to overhaul. No clutches to replace. No brakes to re-line. No batteries to charge. No irritating gas fumes. And of importance, extra heavily reinforced floors are not required and costly floor damage because of materials handling is eliminated.

When considering pallet handling or any materials handling, it will pay you to look into the tremendous advantages that Cleveland Tramrail cranes offer.

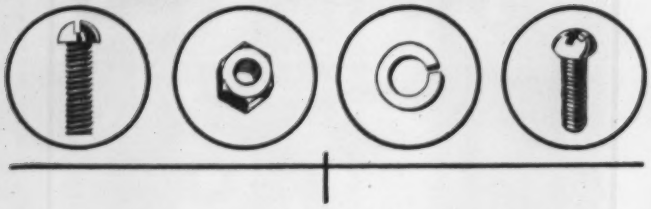
GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7878 East 284th Street, Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Why Leading Electronic Equipment Manufacturers Have Selected Allmetal Stainless Fasteners



Because they can count on getting the fasteners they need *straight from stock*—fast!—from the firm that manufactures more sizes and types than any other in the world.

They know that Allmetal is where many industry specials become standards — where deliveries are measured in hours rather than weeks.

But our huge stock isn't the only reason that more and more electronic equipment manufacturers are turning to Allmetal for their stainless fastener needs. Modern production facilities consistently meet the rigid quality requirements of the industry. These enlarged facilities are geared to produce the fasteners in demand by electronic equipment manufacturers—Phillips heads, pan heads, thin radio and small pattern nuts, captive screws, etc.

So when considering your stainless fastener needs, consider the firm selected by electronic equipment manufacturers. And don't forget, if you need custom specials to your exact specifications, our 26 years of specialization in tough alloys insure perfect fabrication. Write or phone your needs.

Allmetal's new condensed stock list catalog P330 is just off the press. Send for your free copy today.

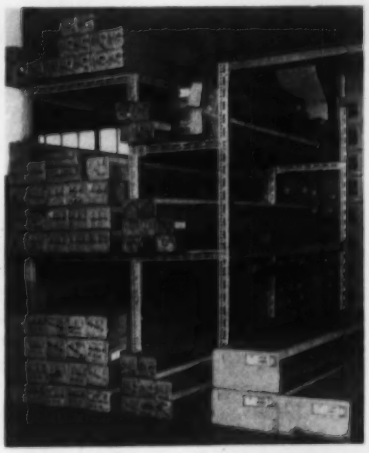
MANUFACTURERS SINCE 1929
ALLMETAL
SCREW PRODUCTS COMPANY, INC.
GARDEN CITY NEW YORK

NEW PRODUCTS and equipment

moderate thrust loads. Sizes are ¼, ⅓, ½ and ¾-hp. They are available in 115 or 230-v ratings. All motors operate at 60 cycles, 1725 rpm. *Write*: General Electric Co., Schenectady 5, N. Y. *Phone*: Schenectady 4-2211

Framing Material

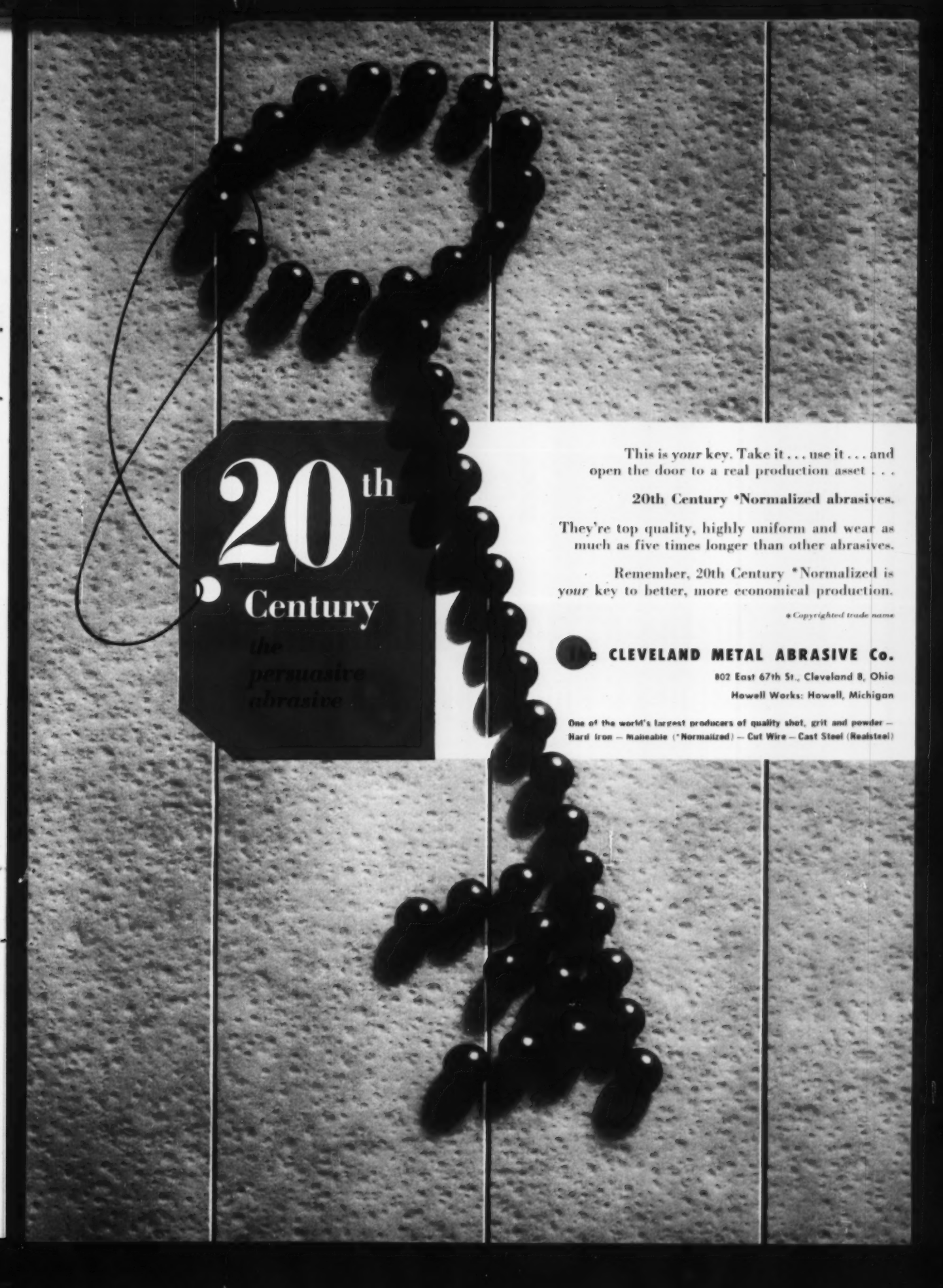
The improved Dexion Slotted Angle, all-purpose fabricating material has round holes and transverse slots at 3-in. intervals. Designated type 225-80, it can be used interchangeably with the original line.



The improved type retains the lengthwise slots of the design. It measures 2¼ x 1½ x 0.080 in. It is made from cold-rolled steel with an electrogalvanized finish. *Write*: Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill. *Phone*: Lafayette 3-2200

Combustion Safeguards

Two new Wheelco Flame-otrol systems are offered: The 1400 series operates on the flame rectification principle; the 1500 series uses a lead sulphide, photoconductive



This is *your* key. Take it . . . use it . . . and open the door to a real production asset . . .

20th Century *Normalized abrasives.

They're top quality, highly uniform and wear as much as five times longer than other abrasives.

Remember, 20th Century *Normalized is *your* key to better, more economical production.

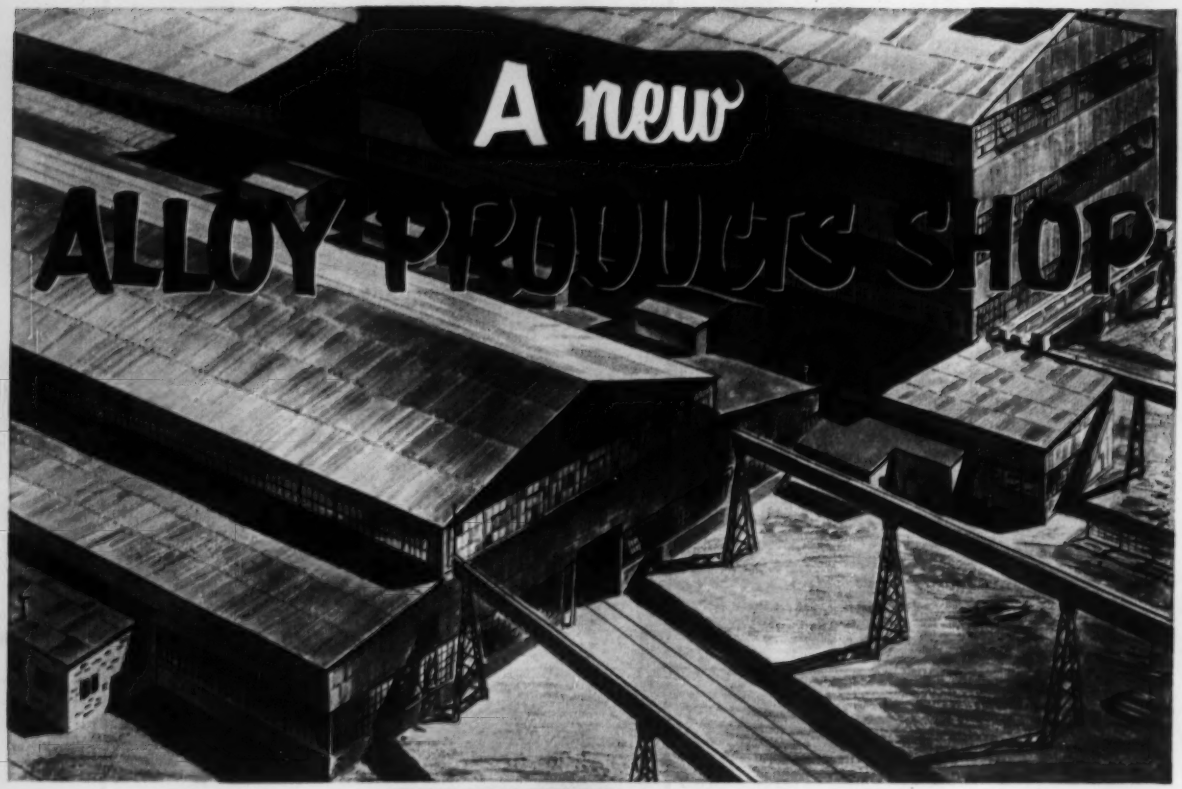
* *Copyrighted trade name*

The CLEVELAND METAL ABRASIVE Co.

802 East 67th St., Cleveland 8, Ohio

Howell Works: Howell, Michigan

One of the world's largest producers of quality shot, grit and powder — Hard Iron — Malleable (*Normalized) — Cut Wire — Cast Steel (Realsteel)



for the exclusive fabrication of stainless and alloy steel products

The new plant shown above, now finished and in operation, permits us to fabricate stainless and alloy steels in a shop completely segregated from our carbon steel operations.

Purity is Paramount—From an experience of many years in making *both* carbon and alloy equipment for industry, it has been demonstrated that the ideal set-up is—*segregation.* For top quality it is better that high-grade alloy steels be not exposed to contamination by tools and equipment used to make ordinary carbon steel products.

Sun Ship's new Alloy Products Shop, therefore, marks a distinct step forward in a great and growing field. Chemical plants, oil refineries, atomic energy plants, and many other types of industry are finding more and more uses for equipment boasting the special strengths and virtues contributed only by alloy steels.

Every Size and Type—In this new shop we are working with all of the 300 or 400 series of alloys, clad steels and aluminum; and are fabricating such products as pressure vessels, tanks, towers, troughs, autoclaves, reactors, hoppers, kettles, platework and machinery. All sizes and types are handled; and pieces too long for delivery by rail can be shipped direct by water from our own docks on the Delaware.

Every Facility—The new shop is an integral part of Sun Ship's huge plant at Chester, Pa.—an impressive blend of steel fabricating shops, forge shops, boiler and tank shops, machine shops and every other facility needed for building the many types of made-to-order equipment required for modern industry.

For more specific information about our new Alloy Products Shop, for estimate, advice or a representative's personal call, just get in touch with our Sales Engineering Department. Your inquiry will receive prompt and expert attention.

Sun

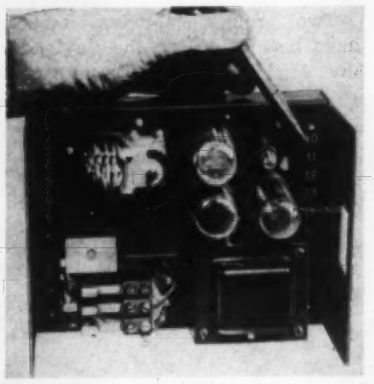
SHIPBUILDING & DRY DOCK COMPANY

ON THE DELAWARE SINCE 1916 CHESTER, PA.

25 BROADWAY • NEW YORK CITY

cell responsive to infrared as a detection element. Both use conventional industrial sensing systems.

The units have a plug-in chassis, designed for maximum accessibility. Other features include a safety



terminal strip, convenient checking strips (see photo) and the use of standard electronic tubes. *Write*: Wheelco Instruments Division, Barber-Colman Co., Rockford, Ill. *Phone*: 4-7871

Direct-Current Welder

The Controlarc, a magnetic amplifier-rectifier welder, provides continuous automatic arc control from strike to end of pass. Separate control of voltage and amperage

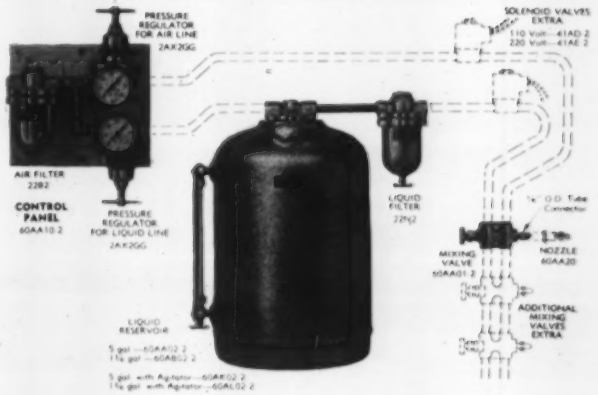
makes it possible to set up any volt-ampere combination within the output range of the unit.

Other features include downdraft cooling and separate, duct-cooled reactor and transformer units.

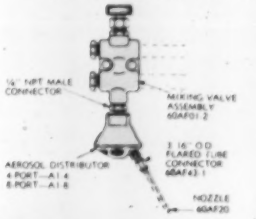
NOW...12 MODELS...2 NEW FEATURES

Norgren **Spray-Lube** *Systems*

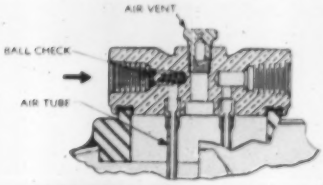
to help you "tool-up" for...
More Output • Longer Tool Life • Lower Costs!



Norgren Spray-Lube is an automatic, air-powered system for more efficient single or multi-point application of liquid metal working compounds.



▶ **NEW Aerosol Distributor for Spray-Lube System**—Simplifies installation where multi-point application of fluids is required but individual control of spray at each point is not necessary.



▶ **NEW Reservoir Agitator for Spray-Lube System**—Agitates metal working compounds that have a tendency to separate, assuring effective application. No moving parts.

PROVED Advantages of Norgren Spray-Lube

Cooling and Lubrication Where You Need It . . . finely-divided spray can reach critical points, penetrate tight crevices and close interfaces.

Rapid, Thorough Dissipation of Heat . . . sprayed compound exposes a greater fluid surface area, capable of absorbing more heat, quickly.

Extra Cooling from Compressed Air used by Spray-Lube System.

Coarse or Fine Spray controlled at each lubrication point . . . easy adjustment of air and liquid pressures controls character of spray.

These and other features of Norgren Spray-Lube have produced these advantages for users . . .

- Longer tool life
- Less machine downtime
- Increased speed and feed of cutting tool
- Big savings in coolant
- Higher quality work
- Eliminates reprocessing of coolants
- Greatly improved working conditions

FOR COMPLETE DETAILS WRITE FOR FORM 4918, AND CASE HISTORY DATA—OR ASK FOR A SPRAY-LUBE DEMONSTRATION IN YOUR PLANT.

Oil Fog Lubricators
Pressure Regulators
Air Filters
Valves
Hose Assemblies

C. A. Norgren CO.
3412 So. Elati, Englewood, Colo.

NEW PRODUCTS and equipment

Welders are available in 200, 300 and 400-amp models. *Write*: Vickers Electric Division, 1815 Locust St., St. Louis 3, Mo. *Phone*: Central 1-5830

Safety Lock Wire

Manufacturers using safety lock nuts can get stainless steel lockwire in toolbox-size packages. It is

available in 1, 5 and 10-lb spools, shipped in minimum lots of 100 lb. The wire is wound on disposable spools for greater convenience.

Wire sizes range from 0.020 to 0.067 in. It is made to government specifications QQ-W-423, AN-W-23, AN-W-24 and AMS-5685-C. *Write:* National Standard Co., Niles, Mich. *Phone:* 1700

Tractor Shovels

Two four-wheel-drive models have been added to the Payloader line. Model HU has 1 cu yd capacity; model HH has 1½-cu yd capacity.

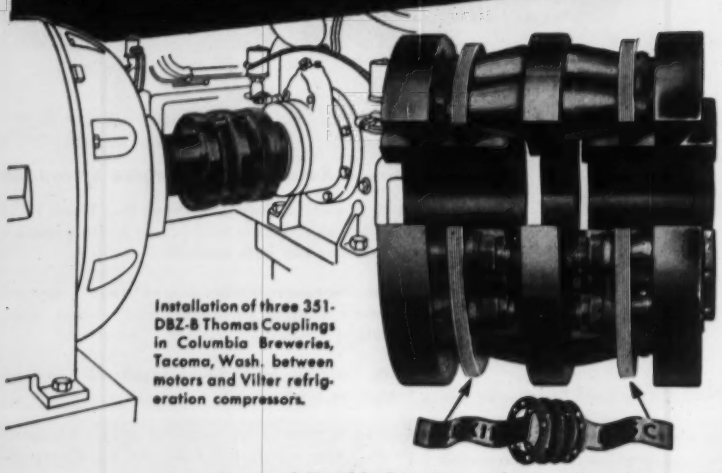
Both units feature 40 degrees of bucket breakout at ground level. *Write*: Frank G. Hough Co., 876 Seventh St., Libertyville, Ill. *Phone*: 2-4000

Circuit Breaker

The Type TQL, 2-in. breaker consists of two pole units with an interlocking trip mechanism assembled as a single unit. It will fit load centers or panelboards designed to take 1-in. Type R or Type TQL units.

The breaker is available in six ratings, from 10 to 50 amp for 120/240 v, ac operation. It has an interrupting rating of 5000 amp

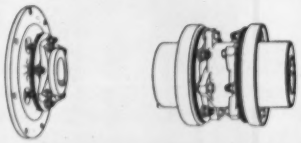
THOMAS FLEXIBLE COUPLINGS...
for more years of better service!



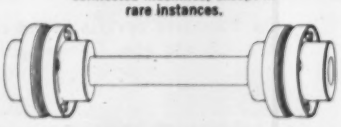
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



THOMAS

Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

for over half a century

the highest quality

FOUNDRY COKE

MILWAUKEE COKE SOLVAY

PM

Quality begins with the choice of the coal. MILWAUKEE SOLVAY is made from *carefully selected* coal purchased for one purpose only—*to make the best foundry coke.*

...a coke with high resistance to shatter and abrasion.

...a coke carefully screened to the right size to fit your cupola.

...a coke consistently high in carbon, low in sulphur and ash.

...a coke in dependable supply—greatly increased productive capacity.

If you are not already a user, may we ship you a *trial* car.

Foundry Service Department
Available Without Obligation

PICKANDS MATHER & COMPANY

Union Commerce Building • Cleveland 14, Ohio

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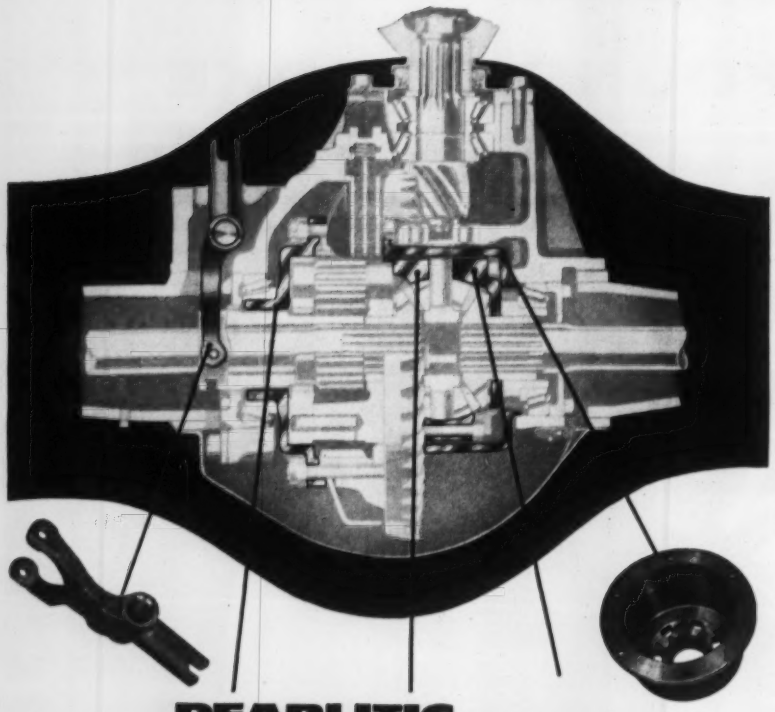
Serving Industry Since 1883

IRON ORE • PIG IRON • COAL • COKE • FERROALLOYS

for **HEAVY DUTY** service



PEARLITIC MALLEABLE CASTINGS

The 2-speed truck axle is a *must* under varying load and road conditions because it provides a tailor-made ratio for every condition. But it takes a severe beating under heavy duty conditions encountered in logging, mining, farming, etc.

That's why Eaton Manufacturing Company, leading producer of 2-speed axles, specifies pearlitic malleable — from National — for several vital parts. For Eaton knows that pearlitic malleable has high ultimate strength . . . resists wear under heavy loads at high speeds . . . possesses excellent non-seizing properties. In addition, pearlitic malleable can be given a smooth finish . . . can be either liquid or air quenched. And perhaps *most important of all, pearlitic malleable machinability index ranges from 80 to 90* (B1112 steel = 100).

Look your product over critically. Pearlitic malleable castings—from National—can replace costlier fabrication methods . . . can offer opportunities of reduction in weight, machining and assembly time. AA-1197

Photos: Courtesy Eaton Manufacturing Company

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY

Cleveland 6, Ohio

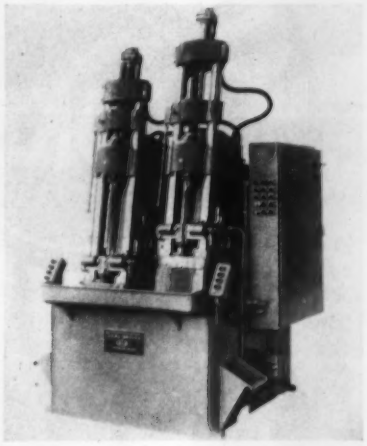
The Nation's largest independent producer of malleable and pearlitic malleable

NEW PRODUCTS and equipment

ac. *Write*: Trumbull Components Dept., General Electric Co., Plainville, Conn. *Phone*: Sherwood 7-1671

Threading Machine

The Scru-Broach is a production unit for tough threading operations in large nuts. It is designed to work with a special type broaching tool that has the appearance of a tap but the cutting action of a broach.

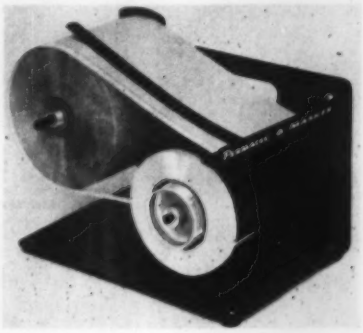


The machine is built with one, two or four work columns, depending on production requirements. *Write*: Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich. *Phone*: Townsend 8-3900

Masking Machine

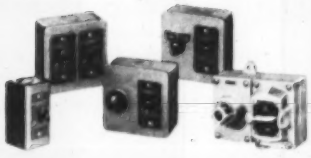
The Permacel-6 masker dispenses a 3 or 6-in. width of masking paper. Masking tape in widths of ½ to 1 in. is aligned along one edge. Weighing 7½ lb, the machine measures 13 x 9 x 8½-in.

Cellophane, cloth or plastic tape



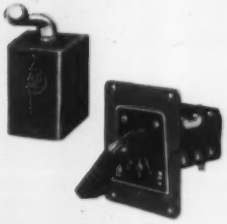
THE ALLEN-BRADLEY LINE

MANUAL CONTROLS — DRUM SWITCHES — REDUCED VOLTAGE

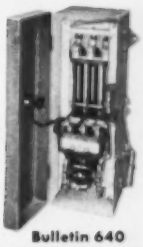


Bulletin 600
Starters for frac. hp motors. Automatically stop overloaded motors

Bulletin 609
Manual across-the-line starter



Bulletin 350
Wide variety of drum controllers up to 500 hp

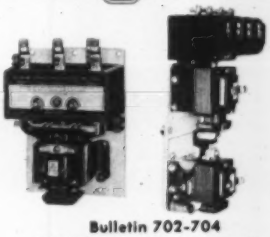


Bulletin 640
Manual resistance starter

Bulletin 646
Manual autotransformer starter

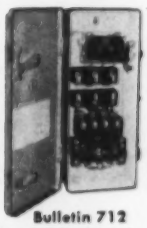
AUTOMATIC CONTROLS — SOLENOID STARTERS — COMBINATION STARTERS

Bulletin 700
Over 300 types of solenoid relays—1 to 8 poles

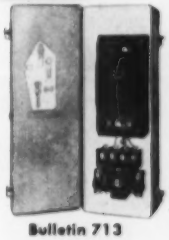


Bulletin 702-704
Full line of solenoid contactors in 9 sizes up to 900 amperes

Bulletin 709
Starters up to 300 hp, 220 v; 600 hp, 440-550 v

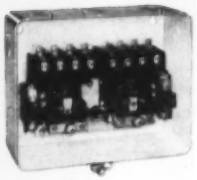


Bulletin 712
With manual disconnect

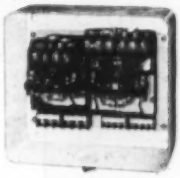


Bulletin 713
With circuit breaker

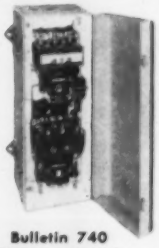
AUTOMATIC CONTROLS — RESISTANCE STARTERS — AUTOTRANSFORMER STARTERS



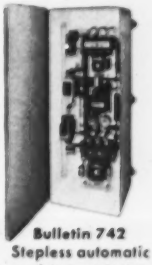
Bulletin 705
Reversing switch with overload relays



Bulletin 715
Multi-speed starters for 2, 3, & 4 speeds



Bulletin 740
2-Step automatic resistance starter



Bulletin 742
Stepless automatic resistance starter

Bulletin 746
Automatic reduced voltage autotransformer starter

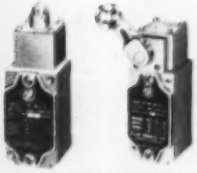
ACCESSORIES — LIMIT SWITCHES — PUSH BUTTONS

Bulletin 848
Dashpot timer

Bulletin 849
Pneumatic timer

Bulletin 850
Motor-driven timer

Bulletin 802
Limit switch



Bulletin 802T
Oiltight limit switches

Bulletin 800-800T Push Buttons
Hundreds of standard, heavy duty, and oiltight push buttons, and pilot lights

For complete information on the Allen-Bradley line, please write for the A-B 120-page Handy Catalog.

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY

Write to
Allen-Bradley Co.
1320 S. Second St.
Milwaukee 4, Wis.
In Canada—
Allen-Bradley Canada Ltd.
Galt, Ont.

The Brown Boggs Foundry & Machine Company, Ltd., of Hamilton, Canada, who manufactures this 200-ton Press, thoroughly checked all types of v-belt. They wanted a v-belt that would give efficient, vibrationless, full power delivery. They wanted a v-belt that could be installed quickly and easily. Only Veelos met *both* requirements. And here's what Brown Boggs says about their selection of Veelos . . .

"...for best operating condition ...for the user's convenience"*

Brown Boggs picked Veelos v-belt

*"*We feel that our own factory assembly has put this Press in the best operating condition. To eliminate the necessity for dismantling any part of the equipment, and for the user's convenience in changing belts, we have equipped the drive with Veelos V-Belting.*"

Brown Boggs selected Veelos even though it cost more than ordinary v-belt. They know, however, that "what's best for their customer, is best for their business!" It will pay you to equip your machines with Veelos v-belt. Once you've done that you'll be an enthusiastic Veelos user, too.

Veelos is known as Veelink in Canada and foreign countries.

VEELOS
THE LINK
V-BELT

Get the full story on Veelos... write today for your free copy of the VEELOS DATA BOOK.

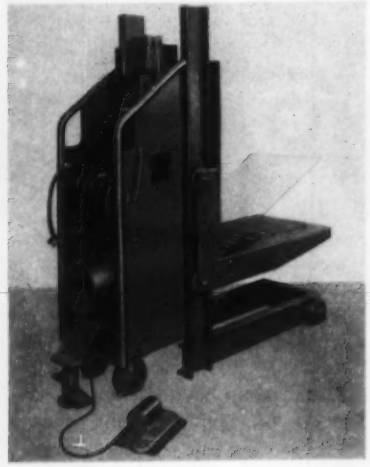
MANHEIM MANUFACTURING & BELTING COMPANY
613 Manbel Street, Manheim, Penna.

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

can be used. In place of masking paper, transparent or opaque films, cloth or treated papers can be used. *Write:* Permacel Tape Corp., New Brunswick, N. J. *Phone:* Charter 7-7900

Heavy-Duty Stacker

The new Portelvator incorporates an electric-mechanical lift. Load capacity is 3000 lb; maximum height is 48 in. The roller-equipped platform measures 20 x 36 in. and operates at 58 in. a minute.

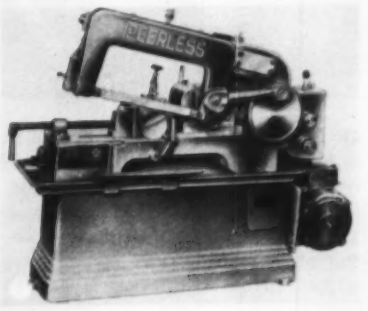


Other features include a worm, worm gear and screw power transmission; reversing magnetic starter; and gear-driven limit switch. *Write*: Hamilton Tool Co., 848 S. Ninth St., Hamilton 1, O. *Phone*: 4-8358

Cold Metal Saw

Three speeds give the Speedy-Cut 3-S6 a wider range for toolroom and production use. A full base houses the gear transmission.

Length of stroke is 5½-in. with



PUT MUSCLE behind your BLAST CLEANING

Does your present abrasive have muscle enough to prove itself in performance? You can't judge an abrasive by looks, claims or promises. The only test of any abrasive is its *cost per ton of castings cleaned.* Because of exclusive metallurgical characteristics, Malleabrasive gives you the lowest cost per ton cleaned of any premium abrasive on the market! This has been proved in hundreds of production tests by users throughout the country. Prove it in your own production test —put muscle behind *your* blast cleaning with Malleabrasive! *We GUARANTEE that Malleabrasive will give you lowest cost per ton of castings cleaned.*

To order Malleabrasive, or for additional information on running a test, contact Globe Steel Abrasive Co., Mansfield, Ohio.

U. S. Patent # 2184926 (Other patents pending)

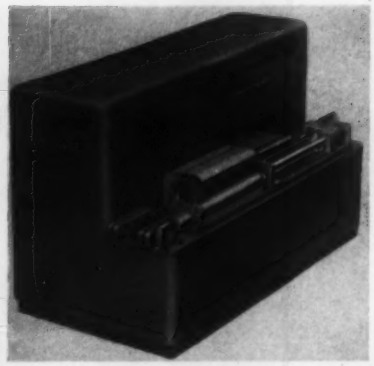
MALLEABRASIVE

NEW PRODUCTS and equipment

a 14-in. saw blade. Maximum capacity, straight cutting, is 6¾ x 6¾-in. *Write*: Peerless Machine Co., 1600 Junction Ave., Racine, Wis. *Phone*: 4-6609

Aluminum Billet Heaters

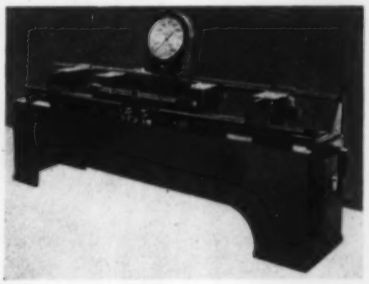
This new line of heaters, known as Model CSC (completely self-contained), features improved coil design, a new billet stop and thermocouple assembly, rounded corners and built-in capacitors.



This model is available in sizes up to 350 kw. The range will be upped to 650 kw by October. *Write*: Magnethermic Corp., 3990 Simon Rd., Youngstown 7, O. *Phone*: Sterling 8-9661

Tensile Testing Unit

Here is a 100,000-lb capacity machine for testing thin walled tubing. It is available with one or two stations and specimen holding devices for square, rectangular, round or oval tubes.

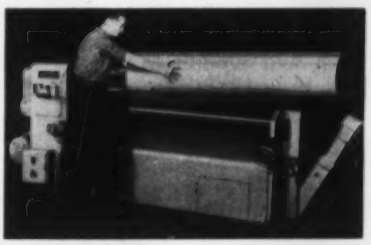


The unit shown is equipped for testing buttwelds of 2½ and 3½-in. tubing. *Write*: Detroit Testing Machine Co., 9390 Grinnell Ave., Detroit 13, Mich. *Phone*: Walnut 1-0659

Slip Roll Formers

Available in power or hand-operated models, these units feature pinch-type rolls to assure production of true cylinders that are free from flat spots.

These machines form cylinders as long as 120 in. from mild steel



up to ¼-in. thick. They are built in heavy, medium and light capacities with 6, 4, 3, 2, 1½ and 1-in. rolls. *Write*: Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N. Y. *Phone*: Taylor 4070

Cowles Ty-Bond

the first new zinc phosphate coatings in twenty years!

Cowles TY-BONDS . . . amorphous and non-sludging . . . are *not* revisions of old-type coatings. They are completely new coatings—completely new formulations.

Cowles TY-BONDS form tight, hard, clean coatings . . . even the most severe bending, flexing or twisting cannot remove TY-BONDS. They cover the metal completely, no pin-points of metal are left unprotected. Old-type coatings leave as much as 60% exposed to corrosion!

Cowles TY-BONDS are economical because they are non-sludging. There is remarkably little waste . . . more than 90% goes into the surface treatment. TY-BONDS save time by reducing coating cycles and tank clean-outs, and meet all government specifications.

Your Cowles Technical Representative will be happy to give you complete information on the uses and applications of Cowles TY-BOND zinc phosphate coatings. Write or call today.

Cowles CHEMICAL COMPANY

7016 Euclid Ave. • Cleveland 3, Ohio

NEW literature

Write directly to the company for a copy

Injector Burners

High-pressure gas burners are pictured and capacities for various pressures listed—bulletin H-63T, 2 pages. Eclipse Fuel Engineering Co., 1001 Buchanan St., Rockford, Ill.

Phosphate Coating

Lyfanite coatings show good bonding properties and resistance to corrosion under salt spray and humidity tests. They are applied to steel, aluminum and other metals—4 pages. Neilson Chemical Co., 6564 Benson St., Detroit 7, Mich.

Waste Disposal

"Steel Mill and Coke By-Product Wastes" is offered—18 pages. Mellon Institute, 4400 Fifth Ave., Pittsburgh 13, Pa.

Tool Catalog

A complete line of mechanics' hand measuring tools and precision instruments, steel tapes, rules, dial indicators, gages, hacksaws, band saws, band knives and precision ground die and flat stock is pictured—catalog 27, 478 pages. L. S. Starrett Co., Athol, Mass.

X-ray Booklet

Discussed are the advantages of constant potential high-voltage circuits (compared with half-wave and self-rectified circuits) in industrial x-ray inspection—booklet XB 404-700, 11 pages. Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

Rotary Gear Shaver

Production advantages, design features and operation of the Red Ring Model GCR-12-in. machine are listed. A typical operating cycle is described—bulletin S55-4, 8 pages. National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.

Presses

Catalogs covering this company's line of punch presses are offered. Ferracute Machine Co., Bridgeton, N. J.

Magnetic Equipment

Permanent, nonelectric, magnetic units designed to hold, convey, control, separate, retrieve and purify metals are covered—bulletin B-207, 4 pages. Eriez Mfg. Co., Erie, Pa.

Ductile Iron Castings

Facilities of this company are described. Typical castings it has produced are illustrated—4 pages. Bethlehem Foundry & Machine Co., Bethlehem, Pa.

Molded, Sheet Rubber

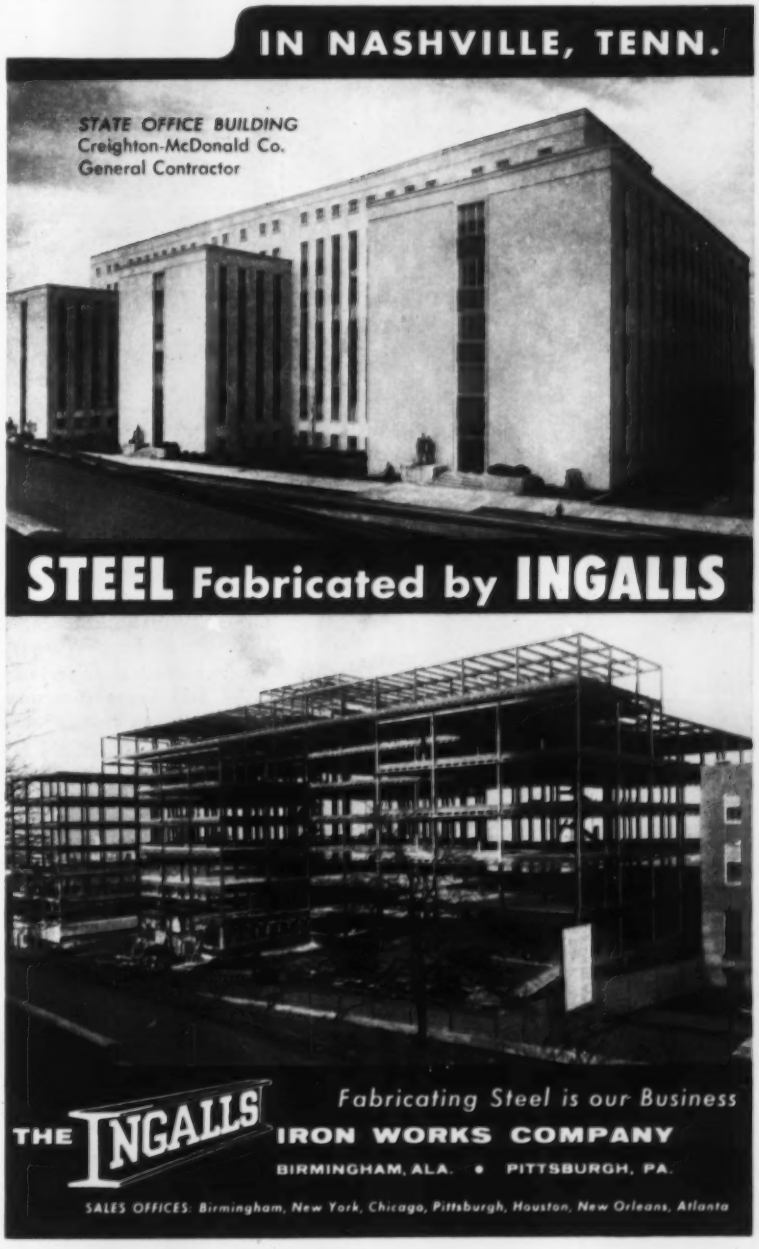
Listed are specifications for six types of natural and synthetic rubber used in molded products and ten types of all-purpose rubber sheet packing—bulletin H-20, 8 pages. Hewitt-Robins Inc., 666 Glenbrook Rd., Stamford, Conn.

Emulsion Cleaner

Brooks Rollene E.C. removes foreign substances from ferrous or nonferrous sheets by floating them away. It was developed to clean metal sheets prior to stamping—bulletin R-47, 2 pages. Brooks Oil Co., 934 Ridge Ave., Pittsburgh 12, Pa.

Portable Loading Dock

The Porta-dock elevates 6000-lb loads 56½-in. from ground level. Its platform measures 72 x 84 in.—bulletin 151, 4 pages. Raymond Corp., 91-134 Madison St., Greene, N. Y.


IN NASHVILLE, TENN.
STATE OFFICE BUILDING
Creighton-McDonald Co.
General Contractor
STEEL Fabricated by INGALLS
THE INGALLS IRON WORKS COMPANY
Fabricating Steel is our Business
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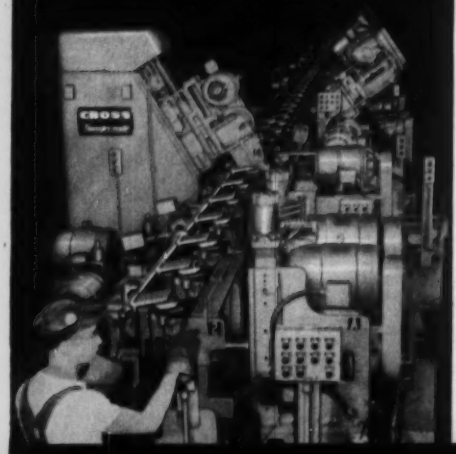
SALES OFFICES: Birmingham, New York, Chicago, Pittsburgh, Houston, New Orleans, Atlanta

OUTLOOK MAR

Warner Gear Reduces Downtime with Cross Machine Control Unit

A Mechanical Eye . . .

At right, set-up man pre-sets tools at Warner Gear Division, Borg-Warner Corp. for Transfer-matic below.



"We are well satisfied with the results we have obtained from the Cross Machine Control Unit," says Emory Watson, Master Mechanic of Warner Gear Division of Borg-Warner Corporation.

Warner Gear's experience is typical of many users. Over 500 Cross Machine Control Units are successfully reducing costs of many metal cutting operations. Here's why:

Toolometers on the Machine Control Unit assure improved tool changing programs and maximum tool efficiency. Tools—pre-set with standard fixtures and gages to eliminate machine adjustments and trial cuts—are stored in the Machine Control Unit convenient and ready when needed. Results: Reduced tool costs . . . less downtime . . . higher operating efficiency.

You can get the same cost saving benefits as Warner Gear. Write, wire or phone The Cross Company for full information, today.

Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

Market Outlook

IF STEEL OUTPUT continues at its present rate the rest of June, the first half will approach record proportions.

The record for a first half was 57.9 million tons of steel for ingots and castings in 1953.

AIMING HIGH—Production in the first half of 1955 should not miss that mark by much. Output in the first four months was 37.1 million tons, the American Iron & Steel Institute reported. STEEL estimates May production at 10.3 million tons. That would make a total of 47.4 million tons for the first five months. A 10-million-ton June would bring the first-half total to 57.4 million tons.

Even if the first half of this year falls short of a record, it will be the second largest first half.

DOWN A BIT—June started with a slightly reduced rate of steelmaking. In the week ended June 5, operations were at 96.5 per cent of capacity, compared with the preceding week's 97 per cent. The decline came from the Memorial Day holiday and a decision by some mills to lower operations from 105 and 106 per cent of capacity to 100 to preserve equipment.

GOIN' FISHIN'—Everyone has been wondering how long steel demand and production will remain high. One thing is pretty sure: Consumption will decline during June, July and August—the months when metalworking plants take summer vacations. Whether demand drops depends on how well business holds up.

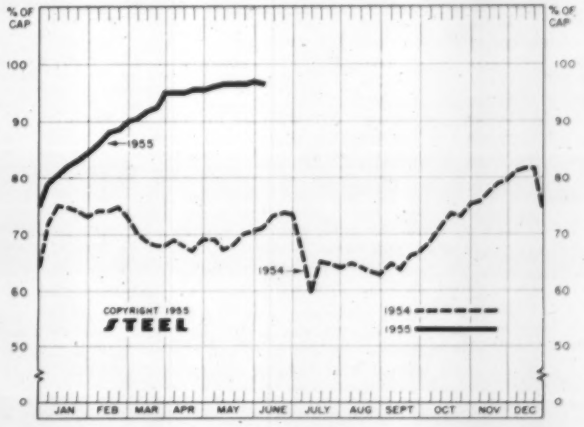
How good business is now, depends on where you are. Demand for cold-rolled carbon steel sheets has filled order books for several months ahead. In contrast, foundry business is slow. In the East, a large supplier of pig iron to the foundries reveals its iron sales in May were 5 per cent under those of April.

CONTRASTS—In the Pacific Northwest, some of the small plate fabricating shops have hardly enough work to keep their forces together. Larger fabricators have fair order backlogs. Over-all, plate demand is strong enough to make that product stand out along with cold-rolled carbon sheets. Railroads and shipbuilders, who sometimes are big users of plates, are not lending much support these days. Biggest taker of plates now is the construction industry. In the first quarter, it got 391,353 tons, or 27 per cent, of the plates shipped by mills. Second in size was machinery, industrial equipment and tools, with 290,929 tons (20 per cent). The automotive industry almost equaled the rail transportation industry and exceeded the shipbuilding industry as a taker of plates in the first quarter. Mill shipments of plates were: Automotive, 119,553 tons; rail transportation, 122,057; and shipbuilding, 97,049.

SQUEEZED—Another product that is getting tight is nickel-bearing stainless sheet and strip. The squeeze is coming not so much from demand as from a restricted supply of nickel. Producers of this stainless are becoming increasingly selective in their commitments.

PRICES STEADY—Scrap prices paused at least for the moment in their downtrend and kept STEEL's price composite on steelmaking grades at $34.67 a gross ton. STEEL's price composite on finished steel holds at $118.45 a net ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended June 5	Change	Same Week 1954	Same Week 1953
Pittsburgh	99	— 0.5*	67	96.5
Chicago	99	0	83.5	105.5
Mid-Atlantic	96.5	0	58	98
Youngstown	96	+ 1	69	105
Wheeling	93	0	69.5	100.5
Cleveland	101	+ 0.5*	67.5	104
Buffalo	104.5	0	67.5	106.5
Birmingham	96	0	71	101
New England	90	+ 5	52	90
Cincinnati	85	— 4.5	67.5	99
St. Louis	92	—14	64.5	89
Detroit	94	0	72.5	107
Western	104	0	80	109
National Rate	96.5	— 0.5	71	100

INGOT PRODUCTION‡

	Week Ended June 5	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	145.3†	144.8	145.1	104.2
NET TONS (In thousands)	2,334†	2,326	2,331	1,674

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 41 Technical Outlook—p. 79

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	May 31 1955	May 24 1955	Month Ago	May Average
(1947-1949=100)	144.8	144.8	144.8	144.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended May 31

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.525
Rails, Light, 40 lb	5.917
Tie Plates	5.275
Axles, Railway	7.500
Wheels, Freight Car, 33 in. (per wheel)	48.500
Plates, Carbon	4.675
Structural Shapes	4.517
Bars, Tool Steel, Carbon (lb)	0.430
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., Alloy	8.875
Bars, H.R., Stainless, 303 (lb)	0.423
Bars, H.R., Carbon	5.000
Bars, Reinforcing	4.963
Bars, C.F., Carbon	8.160
Bars, C.F., Alloy	11.375
Bars, C.F., Stainless, 302 (lb)	0.438
Sheets, H.R., Carbon	4.870
Sheets, C.R., Carbon	5.864
Sheets, Galvanized	7.220
Sheets, C.R., Stainless, 302 (lb)	0.553
Sheets, Electrical	$9.350
Strip, C.R., Carbon	7.493
Strip, C.R., Stainless, 430 (lb)	0.415
Strip, H.R., Carbon	5.075
Pipe, Black, Buttweld (100 ft)	15.000
Pipe, Galv., Buttweld (100 ft)	18.605
Pipe, Line (100 ft)	146.804
Casing, Oil Well, Carbon (100 ft)	154.216
Casing, Oil Well, Alloy (100 ft)	227.875
Tubes, Boiler (100 ft)	‡
Tubing, Mechanical, Carbon	‡
Tubing, Mechanical, Stainless, 304 (100 ft)	167.023
Tin Plate, Hot-dipped, 1.25 lb	8.533
Tin Plate, Electrolytic, 0.25 lb	7.233
Black Plate, Canmaking Quality	6.333
Wire, Drawn, Carbon	8.075
Wire, Drawn, Stainless, 430 (lb)	0.545
Bale Ties (bundle)	5.860
Nails, Wire, 8d Common	7.815
Wire, Barbed (80-rod spool)	7.139
Woven Wire Fence (20-rod roll)	16.925

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	June 1 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 avg.=100)	194.53	194.53	194.53	189.75	156.13
Index in cents per lb	5.270	5.270	5.270	5.140	4.230

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$118.45	$118.45	$118.45	$113.70	$94.32
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	34.67	34.67	34.87	28.50	37.17

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	June 1 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	4.405	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.10	3.60
Palte, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.10	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pittsburgh	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.30
Strip, C.R., Detroit	5.90	5.90	5.90	5.65	4.35-.40
Wire, Basic, Pittsburgh	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50
SEMIFINSHED STEEL					
Billets, Forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$63.00
Wire Rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	4.675	4.675	4.675	4.525	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$34.50	$34.50	$35.50	$30.50	$42.50
No. 1 Heavy Melt, E. Pa.	35.50	35.50	36.50	23.00	32.50
No. 1 Heavy Melt, Chicago	34.00	34.00	34.00	32.00	36.50
No. 1 Heavy Melt, Valley	34.50	34.50	34.50	29.50	44.75
No. 1 Heavy Melt, Cleve.	31.50	31.50	31.50	28.50	42.75
No. 1 Heavy Melt, Buffalo	29.50	29.50	30.50	26.50	36.75
Rails, Rerolling, Chicago	51.50	51.50	52.50	44.00	52.50
No. 1 Cast, Chicago	40.50	40.50	40.50	38.50	48.50
COKE, Net Ton					
Beehive, Furn, Connisvl.	$13.75	$13.75	$13.75	$14.75	$14.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	16.75	15.50
Oven, Fdry, Chicago	24.50	24.50	24.50	24.50	21.00

Daily Nonferrous Price Record

	Price June 1	Last Change	Previous Price	May Avg.	Apr. Avg.	June 1954 Avg.
Copper	36.00	Mar. 29, 1955	33.00	36.000	36.000	30.000
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	13.906
Zinc	12.00	Apr. 6, 1955	11.50	12.000	11.927	10.923
Tin	91.625	June 1, 1955	91.50	91.410	91.458	94.178
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 12, 1955	22.20	23.200	23.200	21.500
Magnesium	28.50	Mar. 21, 1955	27.00	28.500	28.500	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
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Nonferrous Metals

There can't be too much wrong with the aluminum industry. Despite the cries of shortage, production and consumption continue to gain. It's a matter of growing pains

Nonferrous Metal Prices, Pages 124 & 125

IT'S HARD TO DETERMINE these days whether there is an aluminum shortage, and if so, who is suffering from it.

At recent hearings before the House Small Business committee, two opposite views were presented. Nonintegrated firms claimed they are starving for the metal; that the primary producers are robbing them to supply their own facilities. Primary producers claimed it is just the other way around: They are shipping greater quantities to their independent customers than ever before, at the expense of their own fabricating facilities.

Compromise—The truth probably rests somewhere in between those views. But as one producing official stated: "With the government stockpile program still taking a huge cut and civilian demand on an unprecedented rise, there just isn't enough aluminum to go around and still fill the pipelines of supply, which were emptied in January and February."

Another reason for the apparent severity of the shortage in aluminum is the fact that this is one of the fastest growing industries in America today. It requires ever-increasing supplies of raw material to maintain that rate of growth. Cut that supply down a bit, or even maintain the status quo, and a "shortage" results.

Misleading—Here is one explanation of how such a shortage can develop. Manufacturer X gets a rush order requiring 2000 lb of extruded aluminum tubing. (All orders these days are "rush.") He goes to Company A, which says it can't supply that amount today because it can't get enough metal. Mr. X goes to Company B, only to find that B can't take on another 2000 lb because he can't get the metal. Meanwhile, A has written off 2000 lb of business because of the shortage. Now so does B. Mr. X may go to six others before he can find one who will supply him.

A "statistic taker" comes along and asks for the amount of business each has lost because of the shortage. Seven companies honestly say 2000 lb each, for a total shortage of 14,000 lb to satisfy a 2000-lb demand. This may or may not be the case. But from the industry's viewpoint, it comes down to the fact that each month sees increased production in all categories, primary and fabricated. There can't be much wrong, except for growing pains, with an industry like that.

STEEL's Metal Price Averages for May, 1955
(Cents per lb)

Electrolytic Copper, deld. Connecticut	36.000
Lead, St. Louis	14.800
Prime Western Zinc, E. St. Louis, Ill.	12.000
Straits Tin, New York	91.410
Primary Aluminum Ingots, deld.	23.200
Magnesium, Freeport, Tex.	28.500
Nickel, f.o.b. refinery	64.500

New Boosts for Aluminum

The outlook for increased capacity of primary aluminum got two unexpected boosts. First came the statement from Richard S. Reynolds Jr., president of Reynolds Metals Co., that his company was considering expansion in Sheffield, Ala. It would involve about $16 million and add 50 million lb annually to Reynolds' capacity for ingot. But tax legislation now before the state government caused the company to take another look at the plans, with a possible move of the addition to its facilities at Corpus Christi, Tex. Gov. James E. Folsom of Alabama says Reynolds will build in his state, and that taxation differences will be straightened out. Mr. Reynolds told STEEL that would be fine with the company because it would be more economical to expand in Alabama. But if the tax situation remains unchanged there, Texas will get the plant.

The other boost came when the government announced that St. Joseph Lead Co. and Pittsburgh Consolidation Coal Co. have applied for fast amortization on a reduction facility in Pennsylvania estimated to cost $85 million. Capacity would be about 66,000 tons of aluminum a year. This has been an on-again, off-again project for some time, and neither of the principals was prepared to say much about it. It's no secret that Pittsburgh Consolidation is seeking new outlets for its coal. It is said the company has developed an economical process for using coal to supply the huge power requirements for making aluminum. Most observers think it is a logical step for a basic nonferrous company, like St. Joe, to enter the aluminum field. Neither company is among those rumored to be under consideration by the government in its "third round" of expansion in aluminum.

In the meantime, construction of Anaconda's reduction plant at Columbia Falls, Mont., enters its final stage. The first pot line will come in about July 1, to be followed by the second two months later and the third two months after that. Some of that metal will be in circulation later this year, but the main effects will not be felt until early 1956.

Diecasters Optimistic

Zinc diecasters are facing the second half with confidence, judging from their advance orders of metal. One company reported that most users who buy on a semiannual contract are asking for about the same base quantity, but they are increasing their options. The producer points out, of course, that if things get bad, the consumers will drop the option. But it still looks good on the order books.

Market Memos

- Copper & Brass Warehouse Association Inc. says the industry will add 700,000 sq ft of space to its facilities at a cost of $8 million to $10 million over the next year. About 30 per cent will go for new processing machinery and materials handling equipment.
- The International Tin Agreement is only 77 consumers' votes and 179 producers' votes short of ratification. Latest country to ratify was Belgium, both as a producer and consumer.
- The Senate Finance Committee has approved the bill to extend the suspension of import taxes on copper for three years.

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BRASS SPECIAL

INTERMEDIATE

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Columbus, O. Chicago St. Louis New York

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.80; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.50; No. 195, 4.5% Cu, 0.8% Si, 25.90; No. 214, 3.8% Mg, 26.40; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic 36.00 deld. Conn. Valley; 36.00 deld. Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$100 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 99% +, cups or ingot, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8%, self-palletizing pig 28.50; notched ingot 29.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.50 for both pig and ingot. Sticks 1.3 in. diameter, 49.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 34.00; alloy M 36.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $300-$302 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom., per troy oz.

Palladium: $18-$20 per troy oz.

Platinum: $76-$79 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 90.50 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod $68.70 per lb; powder $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 91.625.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max) $3.95, grade A-2 (0.5% Fe max) $3.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots $4.35-$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 12.00; brass special, 12.25; intermediate, 12.50, E. St. Louis, freight allowed over 0.50 per pound. High grade, 13.35; special high grade, 13.50. Diecasting alloy ingot No. 3, 16.00; Nos. 2 and 5, 16.50.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $7.50 per lb. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy, 26.25-28.75; No. 12 foundry alloy (No. 2 grade), 25.50; 5% silicon alloy, 0.60 Cu max, 27.75-28.00; 13 alloy, 0.60 Cu max, 27.75-28.00; 195 alloy, 27.50-28.00; 108 alloy, 26.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 26.50-27.25; grade 2, 25.50-26.25; grade 3, 24.50-25.25; grade 4, 24.00-24.75.

Brass Ingot: Red brass No. 115, 34.50; tin bronze No. 225, 45.00; No. 245, 39.75; high-leaded tin bronze No. 305, 38.00; No. 1 yellow, No. 405, 29.25; manganese bronze No. 421, 31.75.

Magnesium Alloy Ingot: AZ63A, 32.00; AZ91B, 32.00; AZ91C, 32.00; AZ92A, 32.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.74; rod, bar, wire, $1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35; 30,000-lb lots, 41.48; l.c.l., 41.98. Weatherproof, 100,000-lb, 40.78; 30,000 lb, 41.03; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.15; l.c.l., 48.90.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20 per cwt; pipe, full coils $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $14.00-$14.50; sheared mill plate, $11.00; strip, $14.00-$14.50; wire, $10.00-$10.50; forging billets, $8.75; hot-rolled and forged bars, $8.75.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 19.50-20.50; plates, 18.50-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks	...	65	...

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.037	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.3
0.029-0.024	39.7	45.5	36.3	41.8
0.023-0.019	40.4	46.9	37.1	42.6
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.6
0.010-0.0095	46.5	...	42.5	50.3
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72.240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam, 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.10	2	$ 49.55
1	25.35	4	136.65
1¼	34.30	6	244.90
1½	41.00	8	368.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.00, 0.064-in. 76.00, 0.125-in. 61.50, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 59.00, 30,000 lb or more, 0.250 in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 62.00, 30,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in., 72.20; 1 x 4 in., 67.00. Rod, 1 in., 69.00; 2 in., 66.50. Tubing, 1 in. OD x 0.065 in., 90.00. Angles, 1 x 1 x ⅛-in., 75.90; 2 x 2 x ⅛-in., 70.00. Channels, 5 in., 70.90. I-beams, 5 in., 70.20.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 13.50-16.50; old sheets, 11.00-13.50; borings and turnings, 7.50-8.50; crankcases, 11.00-13.50; industrial castings, 11.00-13.50.

BRASS MILL PRICES

	MILL PRODUCTS a			SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.76b	52.36c	....	54.82	32.000	32.000	31.250
Yellow Brass	46.27	46.21d	46.81	49.18	23.875	23.625	22.000
Red Brass, 85%	50.99	50.93	51.53	53.80	28.125	27.875	27.375
Low Brass, 80%	49.75	49.69	50.29	52.56	27.000	26.750	26.750
Naval Brass	49.99	44.30	57.06	53.15	22.125	21.875	21.375
Com. Bronze, 90%	52.78	52.72	53.32	55.34	29.250	29.000	28.500
Nickel Silver, 10%	60.20	62.53g	62.53	....	27.625	27.375	13.813
Phos. Bronze, A, 5%	73.03	73.53	73.53	74.71	32.250	32.000	31.000
Silicon Bronze	58.82	58.01	58.86	60.80e	31.125	30.875	30.125
Manganese Bronze	53.73	47.83	58.24	....	22.125	21.875	21.375
Muntz Metal	48.14	43.95	....	....	22.375	22.125	21.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: No. 1 heavy copper and wire, 31.00-32.50; No. 2 copper, 30.00-31.00 light copper, 28.00-29.00; No. 1 composition **red brass**, 24.50-25.00; No. 1 composition turnings, 24.00-24.50; yellow brass turnings, 15.00; new brass clippings, 21.50-22.00; No. 1 brass rod turnings, 19.50-20.00; light brass, 15.50-16.50; heavy yellow brass, 16.50-18.00; new brass rod ends, 20.50-21.00; auto radiators, unsweated, 18.00-19.00; cocks and faucets, 19.50-20.50; brass pipe, 19.50-20.50.
Lead: Heavy, 11.50-11.75; battery plate, 6.00-6.75; linotype and stereotype, 13.50-14.25; electrotype, 12.00-12.50; mixed babbitt, 12.00-14.00.
Magnesium: Clippings 18.50-19.50; clean castings 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.
Monel: Clippings, 36.00-37.00; old sheets, 32.00-33.00; turnings, 27.50; rods, 36.00-37.00.
Nickel: Sheets and clips, 70.00-80.00; rolled anodes, 70.00-80.00; turnings, 55.00-65.00; rod ends, 70.00-80.00.
Tin: No. 1 pewter 50.00-59.00; block tin pipe 75.00-77.00; No. 1 babbitt 45.00-48.00.
Zinc: Old zinc 4.50-5.00; new die cast scrap 4.75-5.00; old die cast scrap 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Aluminum: 1100 clippings, 18.00-19.00; 3003 clippings, 18.00-19.00; 6151 clippings, 17.50-18.50; 5052 clippings, 17.50-18.50; 2014 clippings, 17.00-18.00; 2017 clippings, 17.00-18.00; 2024 clippings, 17.00-18.00; mixed clippings, 17.00-18.00; old sheet, 14.50-15.00; old cast, 15.00-16.00; clean old cable (free of steel), 17.50-18.50; borings and turnings, 15.00-17.50.
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 48.00; light scrap 43.00.
Copper and Brass: No. 1 copper, 35.00; No. 2 copper, 33.00-33.50; light copper, 31.25-31.75; refinery brass (60% copper) per dry copper content, 30.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)
Copper and Brass: No. 1 copper, 34.00; No. 2 copper, 32.00; light copper, 30.25; No. 1 composition borings, 26.00-26.50; No. 1 composition solids, 26.50-27.00; heavy yellow brass solids, 19.00-19.50; yellow brass turnings, 18.00-18.50; radiators, 19.50-20.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.
Copper: Flat-rolled 51.42, oval 50.92, 5000-10,000 lb; electrodeposited 49.40, 2000-5000 lb lots; cast 50.54, 5000-10,000 lb quantities.
Nickel: Depolarized, less than 100 lb $1.015; 100-499 lb 99.50; 500-4999 lb 95.50; 5000-29,999 lb 93.50; 30,000 lb 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.
Tin: Bar or slab, less than 200 lb, $1.105; 200-499 lb, $1.09; 500-999 lb, $1.085; 1000 lb or more, $1.08.
Zinc: Bar 20.00, bar or flat top 19.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.
Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.
Copper Cyanide: 100 lb 76.80; 200 lb 76.05; 300 lb 75.80; 400-900 lb 75.05; 1000 lb and over 73.05; effective Mar. 24, 1955.
Copper Sulphate: Crystal, 100 lb 21.50; 200 lb 18.50; 300 lb 17.50; 400 lb 17.00; 500-1900 lb 15.50; 2000-10,000 lb 15.25; 10,000 lb and up 15.15. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.
Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.
Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.
Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.
Sodium Stannate: Less than 100 lb, 70.60; 100-600 lb, 56.30; 700-1900 lb, 53.90; 2000-9900 lb, 52.10; 10,000 lb or more, 51.00.
Stannous Chloride (Anhydrous): Less than 50 lb, $1.564; 50 lb, $1.224; 100-300 lb, $1.074, 400-900 lb, $1.049; 1000-1900 lb, $1.025; 2000-4900 lb, 98.80; 5000-19,900 lb, 92.70; 20,000 lb or more, 86.60.
Stannous Sulphate: Less than 50 lb, $1.264; 50 lb, 96.40; 100-1900 lb, 94.40; 2000 lb or more, 92.40.
Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

HERC-ALLOY

THE ORIGINAL ALLOY STEEL CHAIN

● Herc-Alloy is a special all-purpose chain with long-wearing properties and high resistance to impact loading.

● Herc-Alloy is sold in running lengths and in all types and sizes of sling chains assembled to customers' specifications.

● Write for Bulletin 100 covering Herc-Alloy Sling Chains, including helpful information on their care, use and inspection.

● CM also produces a complete line of chain attachments and welded chain of all types including stainless steel and bronze.

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Herc-Alloy®

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key on page 127. Key to footnotes, page 129.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ..... $61.50

INGOTS, Alloy (NT)

Detroit R7 ..... $65.00
Houston S5 ..... 70.00
Midland,Pa. C18 ..... 65.00
Munhall,Pa. U5 ..... 65.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ..... $64.00
Bessemer,Pa. U5 ..... 64.00
Bridgeport,Conn. N19 ..... 69.00
Buffalo R2 ..... 64.00
Clairton,Pa. U5 ..... 64.00
Ensley,Ala. T2 ..... 64.00
Fairfield,Ala. T2 ..... 64.00
Fontana,Calif. K1 ..... 72.00
Gary,Ind. U5 ..... 64.00
Johnstown,Pa. B2 ..... 64.00
Lackawanna,N.Y. B2 ..... 64.00
LoneStar,Tex. L6 ..... 70.00
Munhall,Pa. U5 ..... 64.00
Pittsburgh J5 ..... 64.00
So.Chicago,Ill. R2, U5 ..... 64.00
So.Duquesne,Pa. U5 ..... 64.00
Youngstown R2 ..... 64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ..... $78.00
Bessemer,Pa. U5 ..... 78.00
Bridgeport,Conn. N19 ..... 83.00
Buffalo R2 ..... 78.00
Canton,O. R2 ..... 80.00
Clairton,Pa. U5 ..... 78.00
Conshohocken,Pa. A3 ..... 83.00
Ensley,Ala. T2 ..... 78.00
Fairfield,Ala. T2 ..... 78.00
Fontana,Calif. K1 ..... 86.00
Gary,Ind. U5 ..... 78.00
Geneva,Utah C11 ..... 78.00
Houston S5 ..... 83.00
Johnstown,Pa. B2 ..... 78.00
Lackawanna,N.Y. B2 ..... 78.00
LosAngeles B3 ..... 87.50
Midland,Pa. C18 ..... 78.00
Munhall,Pa. U5 ..... 78.00
Pittsburgh J5 ..... 78.00
Seattle B3 ..... 91.50
So.Chicago R2,U5,W14 ..... 78.00
So.Duquesne,Pa. U5 ..... 78.00
So.SanFrancisco B3 ..... 87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ..... $86.00
Buffalo R2 ..... 86.00
Canton,O. R2, T7 ..... 86.00
Conshohocken,Pa. A3 ..... 93.00
Detroit R7 ..... 86.00
Fontana,Calif. K1 ..... 105.00
Gary,Ind. U5 ..... 86.00
Houston S5 ..... 91.00
Ind.Harbor,Ind. Y1 ..... 86.00
Johnstown,Pa. B2 ..... 86.00
Lackawanna,N.Y. B2 ..... 86.00
LosAngeles B3 ..... 106.00
Massillon,O. R2 ..... 86.00
Midland,Pa. C18 ..... 86.00
Munhall,Pa. U5 ..... 86.00
So.Chicago R2,U5,W14 ..... 86.00
So.Duquesne,Pa. U5 ..... 86.00
Struthers,O Y1 ..... 86.00
Warren,O. C17 ..... 86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 ..... $96.50
Canton,O. R2 ..... 96.50
Cleveland R2 ..... 96.50
Gary,Ind. U5 ..... 96.50
So.Chicago R2, W14 ..... 96.50
So.Duquesne,Pa. U5 ..... 96.50

SKELP

Aliquippa,Pa. J5 ..... 4.00
Fontana,Calif. K1 ..... 4.775
LoneStar,Tex. L6 ..... 4.30
Munhall,Pa. U5 ..... 3.90
SparrowsPoint,Md. B2 ..... 3.90
Warren,O. R2 ..... 3.90
Youngstown R2, U5 ..... 3.90

WIRE RODS

AlabamaCity,Ala. R2 ..... 4.675
Aliquippa,Pa. J5 ..... 4.675
Alton,Ill. L1 ..... 4.85
Buffalo B11, W12 ..... 4.675
Cleveland A7 ..... 4.675
Donora,Pa. A7 ..... 4.675
Fairfield,Ala. T2 ..... 4.675
Fontana,Calif. K1 ..... 5.475
Houston S5 ..... 4.925
IndianaHarbor,Ind. Y1 ..... 4.675
Johnstown,Pa. B2 ..... 4.675
Joliet,Ill. A7 ..... 4.675
KansasCity,Mo. S5 ..... 4.925
Kokomo,Ind. C16 ..... 4.775
LosAngeles B3 ..... 5.475
Minnequa,Colo. C10 ..... 4.925
Monessen,Pa. P7 ..... 4.675
No.Tonawanda,N.Y. B11 ..... 4.675
Pittsburg,Calif. C11 ..... 5.225
Portsmouth P12 ..... 4.675
Roebling,N.J. R5 ..... 4.775
So.Chicago,Ill. R2 ..... 4.675
SparrowsPoint,Md. B2 ..... 4.775
Sterling,Ill.(1) N15 ..... 4.675
Sterling,Ill. N15 ..... 4.775
Struthers,O. Y1 ..... 4.675
Torrance,Calif. C11 ..... 5.475
Worcester,Mass. A7 ..... 4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 ..... 4.25
Aliquippa,Pa. J5 ..... 4.25
Bessemer,Ala. T2 ..... 4.25
Bethlehem,Pa. B2 ..... 4.30
Birmingham C15 ..... 4.25
Clairton,Pa. U5 ..... 4.25
Fairfield,Ala. T2 ..... 4.25
Fontana,Calif. K1 ..... 4.90
Gary,Ind. U5 ..... 4.25
Geneva,Utah C11 ..... 4.25
Houston S5 ..... 4.30
Ind.Harbor,Ind. I-2 ..... 4.25
Johnstown,Pa. B2 ..... 4.30
KansasCity,Mo. S5 ..... 4.30
Lackawanna,N.Y. B2 ..... 4.30
LosAngeles B3 ..... 4.95
Minnequa,Colo. C10 ..... 4.70
Munhall,Pa. U5 ..... 4.25
Niles,Calif. P1 ..... 4.90
Portland,Oreg. O4 ..... 5.00
Phoenixville,Pa. 4.20
Seattle B3 ..... 5.00
So.Chicago U5, W14 ..... 4.25
So.SanFrancisco B3 ..... 4.90
Torrance,Calif. C11 ..... 4.95
Weirton,W.Va. W6 ..... 4.25

Wide Flange

Bethlehem,Pa. B2 ..... 4.30
Clairton,Pa. U5 ..... 4.25
Fontana,Calif. K1 ..... 5.25
Lackawanna,N.Y. B2 ..... 4.30
Munhall,Pa. U5 ..... 4.25
Phoenixville,Pa. P4 ..... 4.30
So.Chicago,Ill. U5 ..... 4.25

Alloy Stand. Shapes

Clairton,Pa. U5 ..... 5.20
Fontana,Calif. K1 ..... 6.60
Gary,Ind. U5 ..... 5.20
Houston S5 ..... 5.25
Munhall,Pa. U5 ..... 5.20
So.Chicago,Ill. U5 ..... 5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 ..... 6.40
Bessemer,Ala. T2 ..... 6.40
Bethlehem,Pa. B2 ..... 6.45
Clairton,Pa. U5 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Fontana,Calif. K1 ..... 7.05
Gary,Ind. U5 ..... 6.40
Geneva,Utah C11 ..... 6.40
Houston S5 ..... 6.45
Ind.Harbor,Ind. I-2, Y1 ..... 6.40
Johnstown,Pa. B2 ..... 6.45
KansasCity,Mo. S5 ..... 6.45
Lackawanna,N.Y. B2 ..... 6.45
LosAngeles B3 ..... 7.10
Munhall,Pa. U5 ..... 6.40
Seattle B3 ..... 7.15
So.Chicago,Ill. U5, W14 ..... 6.40
So.SanFrancisco B3 ..... 7.05
Struthers,O. Y1 ..... 6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ..... 6.45
Lackawanna,N.Y. B2 ..... 6.45
Munhall,Pa. U5 ..... 6.40
So.Chicago,Ill. U5 ..... 6.40

PILING

BEARING PILES

Munhall,Pa. U5 ..... 4.25
So.Chicago,Ill. U5 ..... 4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ..... 5.075
Lackawanna,N.Y. B2 ..... 5.075
Munhall,Pa. U5 ..... 5.075
So.Chicago,Ill. U5 ..... 5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 ..... 4.225
Aliquippa,Pa. J5 ..... 4.225
Ashland,Ky.(15) A10 ..... 4.225
Bessemer,Ala. T2 ..... 4.225
Bridgeport,Conn. N19 ..... 4.475
Buffalo R2 ..... 4.225
Clairton,Pa. U5 ..... 4.225
Claymont,Del. C22 ..... 4.225
Cleveland J5, R2 ..... 4.225
Coatesville,Pa. L7 ..... 4.225
Conshohocken,Pa. A3 ..... 4.225
Ecorse,Mich. G5 ..... 4.325
Fairfield,Ala. T2 ..... 4.225
Fontana,Calif.(30) K1 ..... 4.875
Gary,Ind. U5 ..... 4.225
Geneva,Utah C11 ..... 4.225
GraniteCity,Ill. G4 ..... 4.425
Harrisburg,Pa. C5 ..... 4.225
Houston S5 ..... 4.275
Ind.Harbor,Ind. I-2, Y1 ..... 4.225
Johnstown,Pa. B2 ..... 4.225
Lackawanna,N.Y. B2 ..... 4.225
LoneStar,Tex. L6 ..... 4.55
Mansfield,O. E6 ..... 4.225
Minnequa,Colo. C10 ..... 5.075
Munhall,Pa. U5 ..... 4.225
Newport,Ky. N9 ..... 4.225
Pittsburgh J5 ..... 4.225
Riverdale,Ill. A1 ..... 4.225
Seattle B3 ..... 5.125
Sharon,Pa. S3 ..... 4.225
So.Chicago R2, U5, W14 ..... 4.225
SparrowsPoint,Md. B2 ..... 4.225
Steubenville,O. W10 ..... 4.225
Warren,O. R2 ..... 4.225
Weirton,W.Va. W6 ..... 4.225
Youngstown R2,U5,Y1 ..... 4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 ..... 6.025
Geneva,Utah C11 ..... 5.375

PLATES, Wrought Iron

Economy,Pa. B14 ..... 9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.45
Bessemer,Ala. T2 ..... 6.45
Clairton,Pa. U5 ..... 6.45
Cleveland J5, R2 ..... 6.45
Coatesville,Pa. L7 ..... 6.45
Conshohocken,Pa. A3 ..... 6.45
Ecorse,Mich. G5 ..... 6.55
Fairfield,Ala. T2 ..... 6.45
Fontana,Calif.(30) K1 ..... 7.15
Gary,Ind. U5 ..... 6.45
Geneva,Utah C11 ..... 6.45
Houston S5 ..... 6.50
Ind.Harbor,Ind. I-2, Y1 ..... 6.45
Johnstown,Pa. B2 ..... 6.45
Lackawanna,N.Y. B2 ..... 6.45
LosAngeles B3 ..... 7.35
Munhall,Pa. U5 ..... 6.45
Pittsburgh J5 ..... 6.45
Seattle B3 ..... 7.35
Sharon,Pa. S3 ..... 6.45
So.Chicago,Ill. U5, W14 ..... 6.45
SparrowsPoint,Md. B2 ..... 6.45
Youngstown U5, Y1 ..... 6.45

PLATES, Alloy

Claymont,Del. C22 ..... 5.80
Coatesville,Pa. L7 ..... 5.80
Fontana,Calif. K1 ..... 6.45
Gary,Ind. U5 ..... 5.80
Houston S5 ..... 5.85
Ind.Harbor,Ind. Y1 ..... 5.80
Johnstown,Pa. B2 ..... 5.80
Munhall,Pa. U5 ..... 5.80
Newport,Ky. N9 ..... 5.80
Seattle B3 ..... 6.70
Sharon,Pa. S3 ..... 5.80
So.Chicago,Ill. U5, W14 ..... 5.80
SparrowsPoint,Md. B2 ..... 5.80
Youngstown Y1 ..... 5.80

FLOOR PLATES

Cleveland J5 ..... 5.275
Conshohocken,Pa. A3 ..... 5.275
Harrisburg,Pa. C5 ..... 5.275
Ind.Harbor,Ind. I-2 ..... 5.275
Munhall,Pa. U5 ..... 5.275
So.Chicago,Ill. U5 ..... 5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10 ..... 4.475
Ashland l.c.l. (15) A10 ..... 4.975
Cleveland c.l. R2 ..... 4.825
Warren,O. c.l. R2 ..... 4.825

BARS

BAR, Hot-Rolled Carbon

Ala.City,Ala. R2 ..... 4.30
Aliquippa,Pa. J5 ..... 4.30
Alton,Ill. L1 ..... 4.50
Atlanta A11 ..... 4.50
Bessemer,Ala. T2 ..... 4.30
Birmingham C15 ..... 4.30
Bridgeport,Conn. N19 ..... 4.55
Buffalo R2 ..... 4.30
Canton,O. R2 ..... 4.40
Clairton,Pa. U5 ..... 4.30
Cleveland R2 ..... 4.30
Ecorse,Mich. G5 ..... 4.40
Emeryville,Calif. J7 ..... 5.05
Fairfield,Ala. T2 ..... 4.30
FairlessHills,Pa. U5 ..... 4.45
Fontana,Calif. K1 ..... 5.00
Gary,Ind. U5 ..... 4.30
Houston S5 ..... 4.55
Ind.Harbor,Ind. I-2, Y1 ..... 4.30
Johnstown,Pa. B2 ..... 4.30
Joliet,Ill. P22 ..... 4.30
KansasCity,Mo. S5 ..... 4.55
Lackawanna,N.Y. B2 ..... 4.30
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 4.40
Midland,Pa. C18 ..... 4.30
Milton,Pa. M18 ..... 4.30
Minnequa,Colo. C10 ..... 4.75
Niles,Calif. P1 ..... 5.00
N.Tonawanda,N.Y. B11 ..... 4.30
Pittsburg,Calif. C11 ..... 5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 ..... 5.05
Seattle B3, N14, P23 ..... 5.05
So.Chicago R2,U5,W14 ..... 4.30
So.Duquesne,Pa. U5 ..... 4.30
So.SanFran.,Calif. B3 ..... 5.05
Sterling,Ill.(1) N15 ..... 4.30
Sterling,Ill. N15 ..... 4.40
Struthers,O. Y1 ..... 4.30
Torrance,Calif. C11 ..... 5.00
Warren,O. R2 ..... 4.30
Weirton,W.Va. W6 ..... 4.30
Youngstown R2, U5 ..... 4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ..... 5.075
Bridgeport,Conn. N19 ..... 5.225
Buffalo R2 ..... 5.075
Canton,O. R2, T7 ..... 5.075
Clairton,Pa. U5 ..... 5.075
Detroit R7 ..... 5.075
Ecorse,Mich. G5 ..... 5.175
Fontana,Calif. K1 ..... 6.125
FairlessHills,Pa. U5 ..... 5.225
Gary,Ind. U5 ..... 5.075
Houston S5 ..... 5.325
Ind.Harbor,Ind. I-2, Y1 ..... 5.075
Johnstown,Pa. B2 ..... 5.075
KansasCity,Mo. S5 ..... 5.325
Lackawanna,N.Y. B2 ..... 5.075
LosAngeles B3 ..... 6.125
Massillon,O. R2 ..... 5.075
Midland,Pa. C18 ..... 5.075
So.Chicago R2,U5,W14 ..... 5.075
So.Duquesne,Pa. U5 ..... 5.075
Struthers,O. Y1 ..... 5.075
Warren,O. C17 ..... 5.075
Youngstown U5 ..... 5.075

BARS, H.R. Leaded Alloy

Warren,O. C17 ..... 5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.45
Bessemer,Ala. T2 ..... 6.45
Bethlehem,Pa. B2 ..... 6.45
Clairton,Pa. U5 ..... 6.45
Cleveland R2 ..... 6.45
Ecorse,Mich. G5 ..... 6.55
Fairfield,Ala. T2 ..... 6.45
Fontana,Calif. K1 ..... 7.70
Gary,Ind. U5 ..... 6.45
Houston S5 ..... 6.70
Ind.Harb.,Ind. I-2, Y1 ..... 6.45
Johnstown,Pa. B2 ..... 6.45
KansasCity,Mo. S5 ..... 6.70
Lackawanna,N.Y. B2 ..... 6.45
LosAngeles B3 ..... 7.15
Pittsburgh J5 ..... 6.45
Seattle B3 ..... 7.20
So.Chicago W14 ..... 6.45
So.Duquesne,Pa. U5 ..... 6.45
So.SanFrancisco B3 ..... 7.20
Struthers,O. Y1 ..... 6.45
Warren,O. R2 ..... 6.45
Youngstown U5 ..... 6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 ..... 4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 ..... 4.30
Atlanta A11 ..... 4.50
Fontana,Calif. K1 ..... 5.00
Niles,Calif. P1 ..... 5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 ..... 5.05
SanFrancisco S7 ..... 4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 ..... 5.20
Gary,Ind. U5 ..... 5.20
Houston S5 ..... 5.45
KansasCity,Mo. S5 ..... 5.45
Youngstown U5 ..... 5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ..... 5.40
BeaverFalls,Pa. M12,R2 ..... 5.40
Buffalo B5 ..... 5.45
Camden,N.J. P13 ..... 5.85
Carnegie,Pa. C12 ..... 5.40
Chicago W18 ..... 5.40
Cleveland A7, C20 ..... 5.40
Detroit R7 ..... 5.40
Detroit B5, P17 ..... 5.60
Donora,Pa. A7 ..... 5.40
Elyria,O. W8 ..... 5.40
FranklinPark,Ill. N5 ..... 5.40
Gary,Ind. R2 ..... 5.40
GreenBay,Wis. F7 ..... 5.40
Hammond,Ind. L2, M13 ..... 5.40
Hartford,Conn. R2 ..... 5.90
Harvey,Ill. B5 ..... 5.40
LosAngeles R2, S30 ..... 6.85
Mansfield,Mass. B5 ..... 5.95
Massillon,O. R2, R8 ..... 5.40
Midland,Pa. C18 ..... 5.40
Monaca,Pa. S17 ..... 5.40
Newark,N.J. W18 ..... 5.85
NewCastle,Pa.(17) B4 ..... 5.40
Pittsburgh J5 ..... 5.40
Plymouth,Mich. P5 ..... 5.65
Putnam,Conn. W18 ..... 5.95
Readville,Mass. C14 ..... 5.95
So.Chicago,Ill. W14 ..... 5.40
SpringCity,Pa. K3 ..... 5.85
Struthers,O. Y1 ..... 5.40
Waukegan,Ill. A7 ..... 5.40
Worcester,Mass. W19 ..... 5.85
Youngstown F3, Y1 ..... 5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19 ..... 4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ..... 6.625
BeaverFalls,Pa. M12,R2 ..... 6.625
Bethlehem,Pa. B2 ..... 6.625
Buffalo B5 ..... 6.625
Camden,N.J. P13 ..... 6.80
Canton,O. T7 ..... 6.625
Carnegie,Pa. C12 ..... 6.625
Chicago W18 ..... 6.625
Cleveland A7, C20 ..... 6.625
Detroit R7 ..... 6.625
Detroit B5, P17 ..... 6.825
Donora,Pa. A7 ..... 6.625
Elyria,O. W8 ..... 6.625
Gary,Ind. R2 ..... 6.625
GreenBay,Wis. F7 ..... 6.625
Hammond,Ind. L2,M13 ..... 6.625
Hartford,Conn. R2 ..... 6.925
Harvey,Ill. B5 ..... 6.625
Lackawanna,N.Y. B2 ..... 6.625
LosAngeles S30 ..... 8.30
Mansfield,Mass. B5 ..... 6.925
Massillon,O. R2, R8 ..... 6.625
Midland,Pa. C18 ..... 6.625
Monaca,Pa. S17 ..... 6.625
Newark,N.J. W18 ..... 6.80
Plymouth,Mich. P5 ..... 6.825
So.Chicago W14 ..... 6.625
SpringCity,Pa. K3 ..... 6.80
Struthers,O. Y1 ..... 6.625
Warren,O. C17 ..... 6.625
Waukegan,Ill. A7 ..... 6.625
Worcester,Mass. A7 ..... 6.925
Youngstown F3, Y1 ..... 6.625

BARS, C.F. Leaded Alloy

Ambridge,Pa. W18 ..... 7.525
Camden,N.J. P13 ..... 7.70
Carnegie,Pa. C12 ..... 7.525
Chicago W18 ..... 7.525
Cleveland C20 ..... 7.525
Monaca,Pa. S17 ..... 7.525
Newark,N.J. W18 ..... 7.70
SpringCity,Pa. K3 ..... 7.70
Warren,O. C17 ..... 7.525

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 ..... 4.30
Atlanta A11 ..... 4.50
Birmingham C15 ..... 4.30
Buffalo R2 ..... 4.30
Cleveland R2 ..... 4.30
Emeryville,Calif. J7 ..... 5.05
Fairfield,Ala. T2 ..... 4.30
FairlessHills,Pa. U5 ..... 4.45
Fontana,Calif. K1 ..... 5.00
Ft.Worth,Tex.(42) T4 ..... 4.90
Gary,Ind. U5 ..... 4.30
Houston S5 ..... 4.55

Ind.Harbor, Ind. 1-2, Y1 4.30
Johnstown,Pa. B2 ..... 4.30
Joliet,Ill. P22 ..... 4.30
KansasCity,Mo. S5 ..... 4.55
Lackawanna,N.Y. B2 ..... 4.30
LosAngeles B3 ..... 5.00
Milton,Pa. M18 ..... 4.30
Minnequa,Colo. C10 ..... 4.75
Niles,Calif. P1 ..... 5.00
Pittsburg,Calif. C11 ..... 5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 ..... 5.05
SandSprings,Okla. S5 ..... 4.80
Seattle B3, N14, P23 ..... 5.05
So.Chicago R2 ..... 4.30
So.Duquesne,Pa. U5 ..... 4.30
So.SanFrancisco B3 ..... 5.05
SparrowsPoint,Md. B2 ..... 4.30
Sterling,Ill.(1) N15 ..... 4.30
Sterling,Ill. N15 ..... 4.40
Struthers,O. Y1 ..... 4.30
Torrance,Calif. C11 ..... 5.00
Youngstown R2, U5 ..... 4.30

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2 ..... 5.70
KansasCity,Kans. S5 ..... 6.50
LosAngeles B3 ..... 5.95
Marion,O. P11 ..... 5.55
Pittsburgh J5, U8 ..... 5.72
Seattle B3, N14, P23 ..... 6.15
So.SanFrancisco B3 ..... 6.90
SparrowsPt. ½-1" B2 ..... 5.70
Williamsport,Pa. S19 ..... 5.60

RAIL STEEL BARS

Avis,Pa. (3) J8 ..... 4.25
ChicagoHts.(3) C2, I-2 ..... 4.20
ChicagoHts.(4) C2, I-2 ..... 4.30
Ft.Worth,Tex.(26) T4 ..... 4.75
Franklin,Pa.(3) F5 ..... 4.20
Franklin,Pa.(4) F5 ..... 4.30
Marion,O.(3) P11 ..... 4.20
Moline,Ill.(3) R2 ..... 4.30
Tonawanda(3) B12 ..... 4.15
Tonawanda(4) B12 ..... 4.30
Williamsport,Pa.(3) S19 ..... 4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks(S.R.) L5 ..... 10.85
McK.Rks.(D.R.)L5 ..... 14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 ..... 4.05
Allenport,Pa. P7 ..... 4.05
Ashland,Ky.(8) A10 ..... 4.05
Cleveland J5, R2 ..... 4.05
Conshohocken,Pa. A3 ..... 4.10
Detroit(8) M1 ..... 4.15
Dravosburg,Pa. U5 ..... 4.05
Ecorse,Mich. G5 ..... 4.15
Fairfield,Ala. T2 ..... 4.05
FairlessHills,Pa. U5 ..... 4.10
Fontana,Calif. K1 ..... 4.825
Gary,Ind. U5 ..... 4.05
Geneva,Utah C11 ..... 4.15
GraniteCity,Ill. G4 ..... 4.25
Ind.Harbor,Ind. I-2, Y1 4.05
Kokomo,Ind.C16 ..... 4.15
Lackawanna,N.Y. B2 ..... 4.05
Mansfield,O. E6 (37) 4.05
Mansfield,O. E6 (38) 4.80
Munhall,Pa. U5 ..... 4.05
Newport,Ky N9 ..... 4.05
Niles,O. N12 ..... 4.05
Pittsburg,Calif. C11 ..... 4.75
Pittsburgh J5 ..... 4.05
Portsmouth,O. P12 ..... 4.05
Riverdale,Ill. A1 ..... 4.05
Sharon,Pa. S3 ..... 4.05
So.Chicago,Ill. W14 ..... 4.05
SparrowsPoint,Md. B2 ..... 4.05
Steubenville,O. W10 ..... 4.05
Warren,O. R2 ..... 4.05
Weirton,W.Va. W6 ..... 4.05
Youngstown U5, Y1 ..... 4.05

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 ..... 5.35
Kokomo,Ind. C16 ..... 5.20
Niles,O. N12 ..... 4.95

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ..... 5.80
Youngstown Y1 ..... 5.80

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 ..... 6.10
Conshohocken,Pa. A3 ..... 6.15
Dravosburg,Pa. U5 ..... 6.10
Ecorse,Mich. G5 ..... 6.20
Fairfield,Ala. T2 ..... 6.10
FairlessHills,Pa. U5 ..... 6.15
Fontana, Calif. K1 ..... 6.875
Gary,Ind. U5 ..... 6.10
Ind.Harbor,Ind. I-2, Y1 6.10
Lackawanna(35) B2 ..... 6.10
Munhall,Pa. U5 ..... 6.10
Pittsburgh J5 ..... 6.10
Sharon,Pa. S3 ..... 6.10
So.Chicago,Ill. U5 ..... 6.10
SparrowsPoint(36) B2 ..... 6.10
Warren,O. R2 ..... 6.10
Weirton, W.Va. W6 ..... 6.10
Youngstown U5, Y1 ..... 6.10

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..... 4.30
Cleveland R2 ..... 4.65
Ind.Harbor,Ind. I-2 ..... 4.30
Warren,O. R2 ..... 4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 ..... 4.95
Cleveland J5, R2 ..... 4.95
Conshohocken,Pa. A3 ..... 5.00
Dravosburg,Pa. U5 ..... 4.95
Ecorse,Mich. G5 ..... 5.05
Fairfield,Ala. T2 ..... 4.95
FairlessHills,Pa. U5 ..... 5.00
Follansbee,W.Va. F4 ..... 4.95
Fontana,Calif. K1 ..... 6.06
Gary,Ind. U5 ..... 4.95
GraniteCity,Ill. G4 ..... 5.15
Ind.Harbor,Ind. I-2, Y1 4.95
Lackawanna,N.Y. B2 ..... 4.95
Middletown,O. A10 ..... 4.95
Newport,Ky. N9 ..... 4.95
Pittsburg,Calif. C11 ..... 5.90
Pittsburgh J5 ..... 4.95
Portsmouth,O. P12 ..... 4.95
SparrowsPoint,Md. B2 ..... 4.95
Warren,O. R2 ..... 4.95
Weirton,W.Va. W6 ..... 4.95
Youngstown Y1 ..... 4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 ..... 7.50
Dravosburg,Pa. U5 ..... 7.50
Ecorse,Mich. G5 ..... 7.60
FairlessHills,Pa. U5 ..... 7.55
Fontana,Calif. K1 ..... 8.55
Gary,Ind. U5 ..... 7.50
IndianaHarbor,Ind. Y1 ..... 7.50
Lackawanna(37) B2 ..... 7.50
Pittsburgh J5 ..... 7.50
SparrowsPoint(38) B2 ..... 7.50
Warren,O. R2 ..... 7.50
Weirton,W.Va. W6 ..... 7.50
Youngstown Y1 ..... 7.50

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 ..... 5.45

SHEETS, Culvert (16 Gage)

	Cu Alloy	Cu Fe
Ashland,Ky.	A10 6.50	....
Canton,O.	R2 ... 6.50	7.10
Dravosburg	U5 ... 5.70	....
Fairfield	T2 ... 5.70	....
Gary,Ind.	U5 ... 5.70	5.95
Ind.Harbor	I-2 ... 5.70	5.95
Kokomo,Ind.	C16 5.80	....
MartinsFry.	W10 5.70	....
Newport,Ky.	N9 .. 5.70	5.95
Pitts.,Calif.	C11 .. 6.45	....
SparrowsPt.	B2 .. 5.70	....

SHEETS, Culvert—Pure Iron

Ashland,Ky A10 ..... 6.75
Gary,Ind. U5 ..... 5.95
MartinsFerry,O. W10 ..... 5.95

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 ..... 5.45‡
Ashland,Ky. A10 ..... 5.45*
Butler,Pa. A10 ..... 5.45†
Canton,O. R2 ..... 5.45‡
Delphos,O. N16 ..... 6.10‡
Dover,O. R1 ..... 5.45‡
Dravosburg,Pa. U5 ..... 5.45†
Fairfield,Ala. T2 ..... 5.45†
Gary,Ind. U5 ..... 5.45*
GraniteCity,Ill. G4 ..... 5.65‡
Ind.Harbor,Ind. I-2 ..... 5.45†
Kokomo,Ind. C16 ..... 5.55‡
MartinsFerry,O. W10 ..... 5.45*
Middletown,O. A10 ..... 5.45†
Newport,Ky. N9 ..... 5.45‡
Niles,O. N12 ..... 5.45‡
Pittsburg,Calif. C11 .. 6.20*
SparrowsPt.,Md. B2 ..... 5.45‡
Warren,O. R2 ..... 5.45†
Weirton,W.Va. W6 ..... 5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ..... 6.325

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ..... 8.20
SparrowsPoint(30) B2 ..... 8.20

SHEETS, Galvannealed Steel

Canton,O. R2 ..... 5.85
Dravosburg,Pa. U5 ..... 5.85
Kokomo,Ind. C16 ..... 6.20
Newport,Ky. N9 ..... 5.85
Niles,O. N12 ..... 5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ..... 5.70

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 ..... 5.70
Butler,Pa. A10 ..... 5.70
Middletown,O. A10 ..... 5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 ..... 6.30
Niles,O.(28) R2 ..... 6.30
Weirton,W.Va. W6 ..... 6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 ..... 8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ..... 5.375
Cleveland R2 ..... 5.375
Dravosburg,Pa. U5 ..... 5.375
Gary,Ind. U5 ..... 5.375
GraniteCity,Ill. G4 ..... 5.575
Ind.Harbor,Ind. I-2 ..... 5.375
Middletown,O. A10 ..... 5.375
Niles,O. N12 ..... 5.375
Youngstown Y1 ..... 5.375

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..... 7.375
Follansbee(23) F4 ..... 6.60
Yorkville,O. W10 ..... 7.375

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 ..... 5.85
Mansfield,O. E6 ..... 5.85
Middletown,O. A10 ..... 5.85
Niles,O. N12 ..... 5.85
Weirton,W.Va. W6 ..... 5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ..... 6.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co, Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod.Steel Strip Corp.
P22 Phoenix Mfg. Co.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...4.05
Allenport,Pa. P7 .....4.05
Alton,Ill. L1 .....4.225
Ashland,Ky.(8) A10 ....4.05
Atlanta A11 .....4.25
Bessemer,Ala. T2 .....4.05
Birmingham C15 .....4.05
Bridgeport,Conn. N19 ..4.55
Buffalo(27) R2 .....4.05
Conshohocken,Pa. A3 ...4.10
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.15
Fairfield,Ala. T2 .....4.05
Fontana,Calif. K1 .....4.825
Gary,Ind. U5 .....4.05
Ind.Harbor,Ind. I-2, Y1.4.05
Johnstown,Pa.(25) B2 ..4.05
Lackaw'na,N.Y.(25) B2.4.05
LosAngeles(25) B3 .....4.80
Milton,Pa. M18 .....4.05
Minnequa,Colo. C10 ....5.15
N.Tonawanda,N.Y. B11..4.05
Pittsburg,Calif. C11 ....4.80
Portsmouth,O. P12 .....4.05
Riverdale,Ill. A1 .....4.05
SanFrancisco S7 .....5.00
Seattle(25) B3, P23 ....5.05
Seattle N14 .....5.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
So.SanFrancisco(25) B3.4.80
SparrowsPoint,Md. B2 ..4.05
Sterling(1) N15 .....4.05
Sterling,Ill. N15 .....4.15
Torrance,Calif. C11 ....4.80
Warren,O. R2 .....4.05
Weirton,W.Va. W6 .....4.05
Youngstown U5 .....4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19 ..7.00
Carnegie,Pa. S18 .....6.70
Fontana,Calif. K1 .....8.10
Gary,Ind. U5 .....6.70
Ind.Harbor,Ind. Y1 ....6.70
LosAngeles B3 .....7.90
Newport,Ky. N9 .....6.70
Seattle P23 .....7.80
Sharon,Pa. S3 .....6.70
So.Chicago W14 .....6.70
Youngstown U5, Y1 ....6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....6.15
Conshohocken,Pa. A3 ...6.15
Ecorse,Mich. G5 .....6.25
Fairfield,Ala. T2 .....6.15
Fontana,Calif. K1 .....7.25
Gary,Ind. U5 .....6.15
Houston S5 .....6.40
Ind.Harbor,Ind. I-2, Y1.6.15
KansasCity,Mo. S5 .....6.40
Lackawanna,N.Y. B2 ...6.15
LosAngeles(25) B3 ....6.90
Seattle(25) B3, P23 ....7.15
Sharon,Pa. S3 .....6.15
So.SanFrancisco(25) B3.6.90
SparrowsPoint,Md. B2 ..6.15
Warren,O. R2 .....6.15
Weirton,W.Va. W6 .....6.15
Youngstown U5, Y1 ....6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....4.30
Warren,O. R2 .....4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.75
Baltimore T6 .....5.75
Boston T6 .....6.30
Cleveland A7, J5 .....5.75
Conshohocken,Pa. A3 ...5.80
Dearborn,Mich. D3 .....5.85
Detroit D2, M1, P20 ....5.85
Dover,O. G6 .....5.75
Ecorse,Mich. G5 .....5.85
Follansbee,W.Va. F4 ....5.75
Fontana,Calif. K1 .....7.50
FranklinPark,Ill. T6 ....5.85
Ind.Harbor,Ind. I-2 ....5.85
Ind.Harbor,Ind. Y1 ....5.75
Indianapolis C8 .....5.90
LosAngeles C1 .....7.80
Middletown,O. A10 .....5.75
NewBedford,Mass. R10..6.20
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5 ..5.75
NewHaven,Conn. A7 ....6.50
NewHaven,Conn. D2 ....6.20
NewKensington,Pa. A6..5.75
Pawtucket,R.I. R3 .....6.40
Pawtucket,R.I. N8 .....6.30
Pittsburgh J5 .....5.75
Portsmouth,O. P12 .....5.75
Riverdale,Ill. A1 .....5.85
Rome,N.Y.(32) R6 .....5.75
Sharon,Pa. S3 .....5.75
SparrowsPt.,Md. B2 ....5.75
Trenton,N.J.(31) R5 ...7.30
Wallingford,Conn. W2 ..6.20
Warren,O. B9, R2, T5..5.75
Weirton,W.Va. W6 .....5.75
Worcester,Mass. A7 ....6.60
Youngstown C8, Y1 ....5.75

STRIP, Cold-Rolled Alloy

Boston T6 .....12.80
Carnegie,Pa. S18 .....12.45
Cleveland A7 .....12.45
Dover,O. G6 .....12.45
Fontana,Calif. K1 .....14.55
FranklinPark,Ill. T6 ..12.45
Harrison,N.J. C18 .....12.45
Pawtucket,R.I. N8 ....12.80
Sharon,Pa. S3 .....12.45
Worcester,Mass. A7 ...12.75
Youngstown C8 .....12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5 .....8.60
Dearborn,Mich. D3 ....8.70
Dover,O. G6 .....8.60
Ecorse,Mich. G5 .....8.70
Ind.Harbor,Ind. Y1 ....8.60

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.1(
Boston T6	6.30	8.35	9.30	11.45	14.1(
Bristol,Conn. W1	...	...	9.30	11.45	...
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.8(
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	....	...
Detroit D2	5.85	8.25	9.20	10.95	...
Dover,O. G6	5.85	8.05	9.00	11.15	13.8(
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.8(
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.8(
NewBritain,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	...
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewKensington,Pa. A6	5.75	8.05	9.00	11.15	...
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
FranklinPark,Ill. T6	...	...	13.40	16.10	19.50
Harrison,N.J. C18	...	...	12.90	15.60	19.00
New York W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	...
Youngstown C8	...	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	...	9.10	10.10	11.00
Brackenridge,Pa. A4	....	...	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	...
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	...	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	...
Newport,Ky. N9	11.95	....	....	...
Vandergrift,Pa. U5	11.95‡	12.50‡	13.00‡	14.0(
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	...
Butler,Pa. A10	....	....	16.60	17.10	...
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.7(
Warren,O. R2	....	....	....	....	12.70‡

*Semiprocessed. †Fully processed only. ‡Coils annealed, semiprocessed ½c lower. §Coils, ¾-cent higher.

Lackawanna,N.Y. B2 ..8.425
Pittsburgh J5 .....8.60
Sharon,Pa. S3 .....8.60
SparrowsPoint,Md. B2..8.425
Warren,O. R2 .....8.60
Weirton,W.Va. W6 .....8.60
Youngstown Y1 .....8.60

STRIP, Electrogalvanized

Cleveland A7 .....5.75*
Dover,O. G6 .....5.75*
Riverdale,Ill. A1 .....5.85*
Youngstown C8 .....5.75*
Warren,O. B9, T5 .....5.75*
Weirton,W.Va. W6 .....5.75*
Worcester,Mass. A7....6.60*

*Plus galvanizing extras.

Strip, Galvanized (Continuous)

Sharon,Pa. S3 .....6.15
Warren,O. B9 .....6.15

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.775
Riverdale,Ill. A1 .....4.625
Sharon,Pa. S3 .....4.475
Youngstown U5 .....4.475

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15
ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$6.60
Dravosburg,Pa. U5 ....6.60
Fairfield,Ala. T2 .....6.70
FairlessHills,Pa. U5 ....6.70
Gary,Ind. U5 .....6.60
GraniteCity,Ill. G4 .....6.70
Ind.Harbor,Ind. I-2, Y1.6.60
Niles,O. R2 .....6.60
Pittsburg,Calif. C11 ....7.35
SparrowsPoint,Md. B2 ..6.70
Warren,O. R2 .....6.60
Weirton,W.Va. W6 .....6.60
Yorkville,O. W10 .....6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5 ....6.20
Follansbee,W.Va. F4 ...6.20
Gary,Ind. U5 .....6.20
GraniteCity,Ill. G4 .....6.30
Ind.Harbor,Ind. Y1 ....6.20
Yorkville,O. W10 .....6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5 ....$7.85
Gary,Ind. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10 .....$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5 .....9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ...5.75
Aliquippa,Pa. J5 .....5.75
Alton,Ill. L1 .....5.925
Atlanta A11 .....5.95
Bartonville,Ill. K4 .....5.85
Buffalo W12 .....5.75
Chicago W13 .....5.75
Cleveland A7, C20 .....5.75
Crawfordsville,Ind. M8..5.85
Donora,Pa. A7 .....5.75
Duluth,Minn. A7 .....5.75
Fairfield,Ala. T2 .....5.75
Fostoria,O.(24) S1 .....5.95
Houston S5 .....6.00
Jacksonville,Fla. M8 ...6.27
Johnstown,Pa. B2 .....5.75
Joliet,Ill. A7 .....5.75
KansasCity,Mo. S5 .....6.00
Kokomo,Ind. C16 .....5.85
LosAngeles B3 .....6.70
Minnequa,Colo. C10 ....6.00
Monessen,Pa. P7 .....5.75
Newark 6-8 ga. I-1 ....6.40
No. Tonawanda B11 ....5.75
Palmer,Mass. W12 .....6.05
Pittsburg,Calif. C11 ....6.70
Portsmouth,O. P12 .....5.75
Rankin,Pa. A7 .....5.75
So.Chicago,Ill. R2 .....5.75
So.SanFrancisco C10 ...6.70
SparrowsPoint,Md. B2 ..5.85
Sterling,Ill.(1) N15 .....5.75
Sterling,Ill. N15 .....5.85
Struthers,O. Y1 .....5.75
Waukegan,Ill. A7 .....5.75
Worcester,Mass. A7 ....6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....7.20
Alton,Ill. L1 .....7.375
Bartonville,Ill. K4 .....7.30
Buffalo W12 .....7.20
Cleveland A7 .....7.20
Donora,Pa. A7 .....7.20
Duluth,Minn. A7 .....7.20
Fostoria,O. S1 .....7.20
Johnstown,Pa. B2 .....7.20
LosAngeles B3 .....8.15
Milbury,Mass.(12) N6 ..7.50
Minnequa,Colo. C10 ....7.45
Monessen,Pa. P7, P16..7.20
Muncie,Ind. I-7 .....7.40
Palmer,Mass. W12 .....7.50
Pittsburg,Calif. C11 ....8.15
Portsmouth,O. P12 .....7.20
Roebling,N.J. R5 .....7.50
So.Chicago,Ill. R2 .....7.20
So.SanFrancisco C10 ...8.15
SparrowsPt.,Md. B2 ....7.30
Struthers,O. Y1 .....7.20
Trenton,N.J. A7 .....7.50
Waukegan,Ill. A7 .....7.20
Worcester A7,J4,T6,W12.7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....6.90
Alton,Ill. L1 .....7.075
Buffalo W12 .....6.90
Cleveland A7 .....6.90
Donora,Pa. A7 .....6.90
Duluth,Minn. A7 .....6.90
Johnstown,Pa. B2 .....6.90
KansasCity,Mo. S5 .....7.50
LosAngeles B3 .....7.85
Minnequa,Colo. C10 ...7.075
Monessen,Pa. P7, P16...6.90
NewHaven,Conn. A7 ....7.20
Palmer,Mass. W12 .....7.20
Pittsburg,Calif. C11 ....7.85
Portsmouth,O. P12 .....6.90
Roebling,N.J. R5 .....7.20
So.Chicago,Ill. R2 .....6.90
So.SanFrancisco C10 ...7.85
SparrowsPoint,Md. B2 ..7.00
Struthers,O. Y1 .....6.90
Trenton,N.J. A7 .....7.20
Waukegan,Ill. A7 .....6.90
Worcester,Mass. A7 ....7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1 .....11.375
Bartonville,Ill. K4 .....11.30
Buffalo W12 .....11.20
Chicago W13 .....11.20
Cleveland A7 .....11.20
Crawfordsville,Ind. M8..11.30
Fostoria,O. S1 .....11.20
Jacksonville,Fla. M8 ...11.73
Johnstown,Pa. B2 .....11.20
Kokomo,Ind. C16 .....11.20
Minnequa,Colo. C10 ...10.95
Monessen,Pa. P16 .....11.20
Muncie,Ind. I-7 .....11.40
Palmer,Mass. W12 .....11.50
Roebling,N.J. R5 .....11.50
So.SanFrancisco C10 ...11.55
Waukegan,Ill. A7 .....11.20
Worcester,Mass. A7, T6..11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 .....9.90
Buffalo W12 .....9.90
Johnstown,Pa. B2 .....9.90
Minnequa,Colo. C10 ..10.025
Monessen,Pa. P16 .....9.90
Muncie,Ind. I-7 .....10.10
Portsmouth,O. P12 .....9.90
Roebling,N.J. R5 .....10.30
SparrowsPt.,Md. B2 ...10.00

ROPE WIRE (A)

Alton,Ill. L1 .....9.75
Bartonville,Ill. K4 .....9.75
Buffalo W12 .....9.75
Fostoria,O. S1 .....9.75
Johnstown,Pa. B2 .....9.75
Monessen,Pa. P7, P16 ..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 .....10.05
Portsmouth,O. P12 .....9.75
Roebling,N.J. R5 .....10.05
SparrowsPt. B2 .....9.85
Struthers,O. Y1 .....9.75
Worcester,Mass. T6 ....9.85
Worcester,Mass. J4 ....10.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Alton, Ill. L1	13.25
Bartonville, Ill. K4	13.25
Monessen, Pa. P16	13.15
Roebling, N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson, Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville, Ind. M8	8.05
Dover, O. G6	7.95
Fostoria, O. S1	7.95
Franklin Park, Ill. T6	8.05
Kokomo, Ind. C16	8.05
Massillon, O. R8	7.95
Milwaukee C23	8.15
Monessen, Pa. P7, P16	7.95
Pawtucket, R.I. N8	8.25
Rome, N.Y. (32) R6	7.95
Trenton, N.J. R5	8.25
Worcester A7, T6, W12	8.25

NAILS, Stock

To Dealers & Mfrs. (7)	Col.
Alabama City, Ala. R2	137
Aliquippa, Pa. J5	137
Atlanta A11	139
Bartonville, Ill. K4	139
Chicago, Ill W13	137
Cleveland A9	142
Crawfordsville, Ind. M8	139
Donora, Pa. A7	137
Duluth, Minn. A7	137
Fairfield, Ala. T2	137
Galveston, Tex. D7	145
Houston, Tex. S5	142
Johnstown, Pa. B2	137
Joliet, Ill. A7	137
Kansas City, Mo. S5	142
Kokomo, Ind. C16	139
Minnequa, Colo. C10	142
Monessen, Pa. P7	137
Pittsburg, Calif. C11	156
Rankin, Pa. A7	137
So. Chicago, Ill. R2	137
Sparrows Pt., Md. B2	139
Sterling, Ill. (1) N15	137
Worcester, Mass. A7	143

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken, Pa. A3	$8.30
Wheeling, W.Va. W10	8.30

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa, Pa. J5	138
Atlanta A11	140
Bartonville, Ill. K4	139
Crawfordsville, Ind. M8	139
Donora, Pa. A7	138
Duluth, Minn. A7	138
Fairfield, Ala. T2	138
Johnstown, Pa. B2	138
Joliet, Ill A7	138
Kokomo, Ind. C16	139
Minnequa, Colo. C10	142
Monessen, Pa. P7	137
Pittsburg, Calif. C11	157
Rankin, Pa. A7	138
Sparrows Pt., Md. B2	140
Sterling, Ill. (1) N15	138
Worcester, Mass. A7	144

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
Alabama City, Ala. R2	$8.77
Buffalo W12	8.77
Donora, Pa. A7	8.77
Duluth, Minn. A7	8.77
Joliet, Ill. A7	8.77
Minnequa, Colo. C10	9.02
So. Chicago, Ill. R2	8.77

Coil No. 6500 Stand.	
Alabama City, Ala. R2	$9.05
Buffalo W12	9.05
Donora, Pa. A7	9.05
Duluth, Minn. A7	9.05
Joliet, Ill. A7	9.05
Minnequa, Colo. C10	9.30
So. Chicago, Ill. R2	9.05

Coil No. 6500 Interim	
Alabama City, Ala. R2	$9.10
Buffalo W12	9.10
Donora, Pa. A7	9.10
Duluth, Minn. A7	9.10
Joliet, Ill. A7	9.10
Minnequa, Colo. C10	9.35
So. Chicago, Ill. R2	9.10

BALE TIES, Single Loop

	Col.
Alabama City, Ala. R2	155
Atlanta A11	157
Bartonville, Ill. K4	157
Crawfordsville, Ind. M8	157
Donora, Pa. A7	155
Duluth, Minn. A7	156
Fairfield, Ala. T2	155
Joliet, Ill. A7	155
Houston S5	160
Kansas City, Mo. S5	160
Kokomo, Ind. C16	157
Minnequa, Colo. C10	160
Pittsburg, Calif. C11	179
So. San Fran., Calif. C10	179
Sparrows Point, Md. B2	157
Sterling, Ill. (1) N15	155

WIRE, Barbed

	Col.
Alabama City, Ala. R2	159**
Aliquippa J5	156‡
Atlanta A11	164
Bartonville, Ill. K4	165
Crawfordsville, Ind. M8	164
Donora, Pa. A7	159†
Duluth, Minn. A7	159†
Fairfield, Ala. T2	159†
Houston, Tex. S5	164†
Johnstown, Pa. B2	162*
Joliet, Ill. A7	159†
Kansas City, Mo. S5	164†
Kokomo, Ind. C16	161†
Minnequa, Colo. C10	164**
Monessen, Pa. P7	162
Pittsburg, Calif. C11	179†
Rankin, Pa. A7	159†
So. Chicago, Ill. R2	159**
So. San Francisco C10	179**
Sparrows Point, Md. B2	164*
Sterling, Ill. (1) N15	163

WOVEN Fence, 9-15 Ga.

	Col.
Ala. City, Ala. R2	146**
Ala. City, 17 ga. R2	241**
Ala. City, 18 ga. R2	251**
Aliq'ppa, Pa. 9-14½ ga. J5	149‡
Atlanta A11	151
Bartonville, Ill. K4	152
Crawfordsville, Ind. M8	151
Donora, Pa. A7	146†
Duluth, Minn. A7	146†
Fairfield, Ala. T2	146†
Houston, Tex. S5	151†
Johnstown, Pa. (43) B2	149
Joliet, Ill. A7	146†
Kansas City, Mo. S5	151†
Kokomo, Ind. C16	148†
Minnequa, Colo. C10	151**
Monessen, Pa. 9 ga. P17	149
Pittsburg, Calif. C11	169†
Rankin, Pa. A7	146†
So. Chicago, Ill. R2	146**
Sterling, Ill. (1) N15	150

WIRE (16 Gage)

	An'ld Stone	Galv. Stone
Ala. City R2	13.15	14.70**
Bartonville K4	13.25	15.15
Buffalo W12	13.15	....
Cleveland A7	13.15	....
Crawf'dsville M8	13.25	15.10
Fostoria, O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer, Mass. W12	13.15	14.70†
Pitts., Calif. C11	13.50	15.05†
So. Chicago R2	13.15	14.70
Sparrows Pt. B2	13.25	15.10*
Sterling (1) N15	13.15	15.05
Waukegan A7	13.15	14.70†
Worcester A7	13.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala. City, Ala. R2	6.90	7.30**
Aliquippa J5	6.90	7.425‡
Atlanta A11	7.00	7.55
Bartonville (48)- K4	7.00	7.575
Buffalo W12	6.90	7.30†
Cleveland A7	6.90	....
Crawfordsville M8	7.00	7.55
Donora, Pa. A7	6.90	7.30†
Duluth, Minn. A7	6.90	7.30†
Fairfield T2	6.90	7.30†
Houston, Tex. S5	7.15	7.55†
Jacks'ville, Fla. M8	7.425	7.96
Johnstown B2 (48)	6.90	7.45*
Joliet, Ill. A7	6.90	7.30†
Kansas City, Mo. S5	7.15	7.55†
Kokomo C16	7.00	7.40†
Los Angeles B3	7.85	....
Minnequa C10	7.15	7.55**
Monessen P7 (48)	6.90	7.45
Palmer, Mass. W12	7.20	7.60†
Pitts., Calif. C11	7.85	8.25†
Portsmouth, O. P12	6.90	....
Rankin A7	6.90	7.30†
So. Chicago R2	6.90	7.30**
So. S. Fran. C10	7.85	8.25**
Spar'waPt. B2 (48)	7.00	7.55*
Sterling (1) (48) N15	6.90	7.475
Struthers, O. (48) Y1	6.90	7.40‡
Worcester, Mass. A7	7.20	....

*Based on 11c zinc; †5c zinc; ‡10c zinc; §Less than 10c zinc; **Subject to zinc equalization extras.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

Base discounts, per cent off list, f.o.b. midwestern plants)

½ in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅞-in. and ⅝-in.	+4
¾-in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoe	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
¾" and smaller	55
⅞" to 1¼", inclusive	58
1⅛" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
¾" or smaller	38
⅞" to 1½", inclusive,	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
¾-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
¾-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger	9.25
⅞-in. under	List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers	List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1⅝	13	25.28	30.31	24.53
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2½	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2⅝	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Standard All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer, Pa. U5	4.45	4.35	4.40	5.35
Ensley, Ala. T2	4.45	4.35	...	5.35
Fairfield, Ala. T2	...	...	...	5.35
Gary, Ind. U5	4.45	4.35	4.40	...
Indiana Harbor, Ind. I-2	4.45	4.35	4.40	...
Johnstown, Pa. B2	...	...	...	(16)5.35
Lackawanna, N.Y. B2	4.45	4.35	...	5.35
Minnequa, Colo. C10	4.45	4.35	...	5.35
Steelton, Pa. B2	4.45	4.35	...	5.35
Williamsport, Pa. S1P	...	...	...	5.35

TIE PLATES

Fairfield, Ala. T2	5.275
Gary, Ind. U5	5.275
Ind. Harbor, Ind. I-2	5.275
Lackawanna, N.Y. B2	5.275
Minnequa, Colo. C10	5.275
Seattle B3	5.425
Steelton, Pa. B2	5.275
Torrance, Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
Kansas City, Mo. S5	11.50
Lebanon, Pa. B2	11.50
Minnequa, Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle B3	12.00

AXLES

Ind. Harbor, Ind. S13	6.75
Johnstown, Pa. B2	6.75

JOINT BARS

Bessemer, Pa. U5	5.425
Fairfield, Ala. T2	5.425
Ind. Harbor, Ind. I-2	5.425
Joliet, Ill. U5	5.425
Lackawanna, N.Y. B2	5.425
Minnequa, Colo. C10	5.425
Steelton, Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield, Ala. T2	7.30
Ind. Harbor, Ind. I-2, Y1	7.30
Kansas City, Mo. S5	7.30
Lebanon, Pa. B2	7.30
Minnequa, Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B2	7.80
So. Chicago, Ill. R2	7.30
Struthers, O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N. Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	21.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frght. allowed	
Carlots	32.20
Ton lots	34.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	33.00-43.00†
Bronze, 5000-lb lots	54.25-57.25†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	49.75-57.25
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	81.25
Tin	14.50*
Zinc, 5000-lb lots	17.75-31.50†
Tungsten	Dollars
Melting grade, 99%	
60 to 200 mesh	4.30-4.40
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.35c, H.S.-L.A.
(31) Widths over ⅝ in.; 0.45c for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ Ga.
(44) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.93	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	..	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless Hills, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1¼		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	26.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	26.5	7.75
Fairless Hills, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.00c; East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50
304L	....	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	36.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	35.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	29.75	38.00	48.25	56.25	55.00	57.25	60.50	64.50	64.50
316L	....	....	....	53.25	61.25	60.00	62.25	65.50	69.50	69.50
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
330	....	....	61.50	....	....	72.00	73.25	81.25	81.25
18-8CbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	27.00	30.75	....	32.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25
414	....	....	24.50	....	....	29.25	30.50	35.25	35.25
416	....	....	24.50	28.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	....	....	....
431	15.00	19.25	25.00	28.75	28.00	29.75	31.00	35.75	35.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Josyin Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	28.00
304	28.30	33.60	29.75
304-L	30.30	35.50	....
310	41.30	47.00	....
316	33.40	38.80	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	30.00	35.30	34.25
347	32.20	38.60	44.25
405	23.90	31.10	....
410	23.40	30.60	....
430	23.40	30.60	24.25
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled: 10%	Strip, Carbon Base, Cold Rolled: Both Sides
Copper*	26.60	33.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	...		4.030
18.25	4.25	1	4.75	...		2.245-2.415
18	4	2	9	...		2.615
18	4	2	....	...		1.705
18	4	1	....	...		1.540
14	4	2	5	...		2.185
13.75	3.75	2	5	...		2.185
13.5	4	3	....	...		1.805
9	3.5	..	....	...		1.115
6	4	2	....	5		1.045
6	4	3	....	6		1.290
1.5	4	1	....	8.5		0.900

Tool steel producers include; A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malle-able	Besse-mer
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden,Ala. R2	52.38	52.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	57.50
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron,O. deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	59.00	59.50
Chester,Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malle-able	Besse-mer
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50 Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	85.00
Keokuk, O.H. & Fdry, 12½ lb pigiets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	$61.00
Lyles,Tenn. T3	70.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.56
Troy,N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Buffalo, 25 cents; Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Atlanta, Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302‡‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140††*		Carbon	Floor
Atlanta	6.79	7.75	8.37	43.43	7.05	...	6.92	8.89	....	7.08	7.09	8.83
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.02[a]	12.54	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25[a]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.57	45.28[a]	7.47	...	7.20	8.60	12.60	7.49	7.37	8.50
Buffalo	6.30	7.40	8.84	....	6.65	...	6.45	7.40	12.30	6.67	6.60	7.85
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	46.05	6.62	...	6.51	7.25	12.05	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	46.10	6.86	...	6.75	7.55	12.30	6.86	6.81	7.89
Cleveland	6.38	7.38	8.25	46.16	6.72	...	6.57	7.35	12.11	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.54	12.25	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[a]	....	6.69	6.52	7.64
Houston	7.35	7.80	9.99	....	7.70	9.30	7.70	9.30	....	7.60	7.35	8.75
Los Angeles	7.50	9.35	9.95	50.15	7.85	11.75	7.45	10.15	13.45	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.44	12.14	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.60	....	7.04	6.87	....
New York	6.97	7.91	8.79	44.95	7.56	...	7.37	8.73[a]	12.43	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.95[a]	6.96	8.80	6.74	7.86[a]	12.26	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.35	12.05	6.69	6.52	7.64
Portland, Oreg.	7.00	7.75	9.10	48.50	7.25	...	7.05	10.20	14.00	7.00	6.85	8.75
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.64[a]	12.34	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.01	....	7.25	7.18	8.30
San Francisco	7.55	8.95	9.45	51.65	7.80	...	7.35	10.05	13.35	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	51.00	8.20	...	7.80	10.95	13.80	7.75	7.80	9.60
Spokane	8.35	9.65[f]	10.15	....	7.80	...	7.80	10.85[ll]	14.55	7.45	7.56	9.60
Washington	6.70	7.99	7.97	....	7.27	...	7.38	9.09	....	7.31	7.06	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11.50-cent zinc except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **½-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ¼-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [a]—500 to 9999 lb; [b]—4000 lb and over; [c]—1000 to 1999 lb; [d]—1000 lb and over; [f]—1500 to 3999 lb; [g]—2000 to 3999 lb; [h]—f.o.b. local delivery in lots of 10,000 lb and over.

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S-440

Wide World

New developments in canmaking raise the question . . .

Can Tin Plate Lines Survive?

ARE THE STEEL INDUSTRY'S tin plate lines, currently operating at capacity, headed for virtual retirement within a decade?

The question was posed in a prediction by William C. Stolk, president, American Can Co. "A high percentage of all metal cans will be tinless in 10 years," he said at the opening of Canco's new research center in Barrington, Ill., last week.

Search of Survival—Research to develop the tinless can has been tagged "operation survival" at the new center. Pointing to strides already made, officials state that 20 years ago 20 lb of tin were needed for each ton of steel in tin plate. Today 10 lb fill the bill. Such products as oil, pet food, liquid detergents, pharmaceuticals and certain dry foods are already being packed in tinless "tin" cans.

Steel, however, still is the leading candidate for metal cans, Mr. Stolk said, because it is the least expensive sheet available in sufficient quantity to meet the needs of 35.6 billion cans annually. Encouraging results in the goal to eliminate tin have come from research with chemically treated steel. Other studies with aluminum, aluminum-coated steel, nickel-plated steel and organic coatings for steel show promise of many canning applications.

Exclusive—One tin plate researcher, not connected with Canco, said he doubted if the electrolytic lines in tin plating mills could be adapted to other plating. But, "some of the equipment in the tin mill certainly would lend itself to other coating operations."

American Can's new research center has 50 diversified laboratories in which about 140 scientists and technicians will conduct projects ranging from bacteriology to metallurgy. Included in the installation are a complete machine shop and an automatic can production line.

Can-Conscious Public—Here's how the canning industry has grown, Mr. Stolk pointed out: At the turn of the century, consumers were using less than 2 billion cans (containing about 250 products) each year. Today's 35.6 billion cans produced annually contain over 1500 food and nonfood items.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 127 & 128

Sheet steel demand continues heavy. Mill operations may lag slightly during the third quarter, but not for lack of business. Rather, it will result from vacations and warm weather difficulties.

Even if there is a slowing down in auto specifications for one reason or another (short of a strike), there will be sufficient volume from other consuming directions to take up the slack which may come about as a result of auto model changeovers hitting their peak in August.

Any cutback in sheet and strip volume by the auto industry will have little effect on third quarter production beyond adjustments in rolling schedules. There is plenty of tonnage to move in and fill gaps that appear. Pittsburgh mills expect no more than a moderate drop in third quarter sales. Some producers would welcome a leveling out in orders. Such would permit them to catch up on deliveries, now running behind.

That is the dominating view in the market. Some observers put it this way: Business in other directions may not fully offset a lag in auto requirements, but at least it will go a long way toward cushioning a slump. Current demand pressure is centered on tonnage placed as a hedge against a possible price increase in the third quarter.

Demand for both hot and cold-rolled sheets continues excellent. Inquiry for galvanized sheets is holding up even better. Some producers of the continuous hot-dipped grade say they have enough tonnage on books to keep them going full tilt throughout the third quarter. Business in enameling stock and practically all grades of electrical sheets is booming. One large producer of the latter is booked full through the fourth quarter.

Activity in nickel-bearing stainless sheets and strip is such that producers are becoming increasingly selective in their commitments. They

are emphasizing to consumers the importance of identifying tonnage with a rating, thus helping the mills in augmenting nickel supplies.

The Watertown, Mass., arsenal takes bids June 20 on a combination 2 and 4-high torque arm rolling mill, to produce cold-rolled strip 8 in. wide to 0.001 or less tolerance.

Steel Bars . . .

Bar Prices, Page 126

Steadily tightening supply conditions are noted in the bar market. While sales continue strong, with no early change in prospect, deliveries are running behind schedule in some instances.

At Pittsburgh, barmakers report users may continue to build stocks over remainder of this month. Cold-drawn mills in the district are booked to capacity well into August on most sizes.

Hot carbon bar business is diversified and active in the East. Little new tonnage can be placed for delivery before August and not too much for shipment that month. Producers still are confining orders to regular customers and on a basis of past requirements.

Both carbon and alloy bar buying by New England users for late third quarter delivery has slackened. Most are concerned with getting in the tonnage they have on order before the expected price increase is effected, probably in July. Some consumers, however, placed their orders too late for price hedging, although the delivery range for bars is broader than for most finished steel products.

Openings for carbon bars in August are narrowing, depending on size and grade with eastern Pennsylvania shipments, until recently, somewhat ahead of Buffalo and Midwest. Converters in some cases have unbalanced stocks of hot rolled, chiefly in grade. Most merchant bar volume in New England is 2 in. and under.

Atlantic Steel Co., Atlanta, has broken ground for its $8.5-million merchant bar and rod mill. The first phase of a modernization and improvement program, it will increase substantially the company's productive capacity and product range, says R. S. Lynch, president. The mill is expected to be in operation by September, 1956. Other features of Atlantic's modernization program include a second electric furnace and a new administration building.

Plates . . .

Plate Prices, Page 126

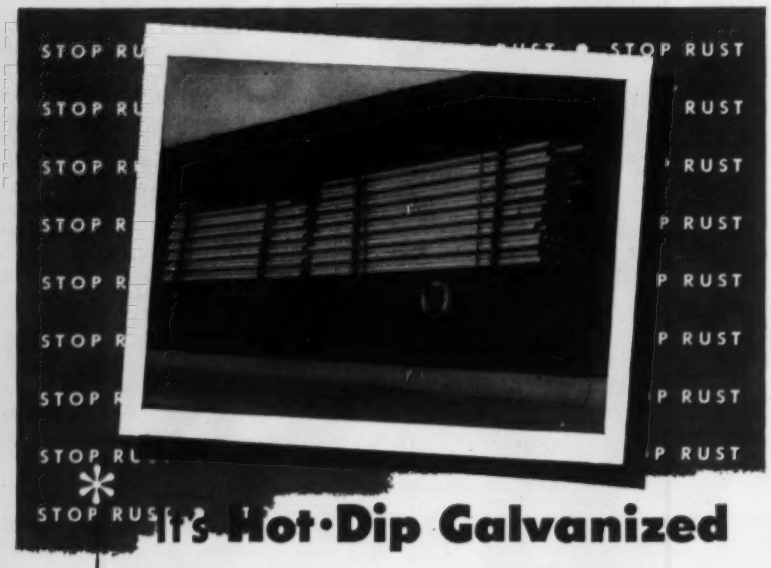
Plates are moving actively, with some producers claiming they have about all the tonnage on their books that they can handle in the third quarter. Some, however, haven't officially opened books for September.

At New York, demand is reported brisk. Some of the more normally active consuming outlets still lag—notably railroad and ship work. There is, however, slow but steady pickup in these lines, plus a good diversified demand from other directions.

In New England, plate sellers are holding district sales to informal allotments. Area fabricating shops find their suppliers are sold out through third quarter on sheared and heavy sizes, with books unopened for the fourth quarter. Lighter universal mill tonnage is available for July shipment. Users of sheared plates are more willing to pay the higher price prevailing on Pittsburgh district tonnage.

Small tank builders are not seriously pressed for steel or heads. Worcester carbuilding shop requirements are heavier; also, railroad car repair shops at Concord, N. H., and Readville, Mass., are taking more steel. Large diameter structural plate pipe, up to 180 in., for highway bridges, is more active.

The shortage of plates has become a problem for construction firms and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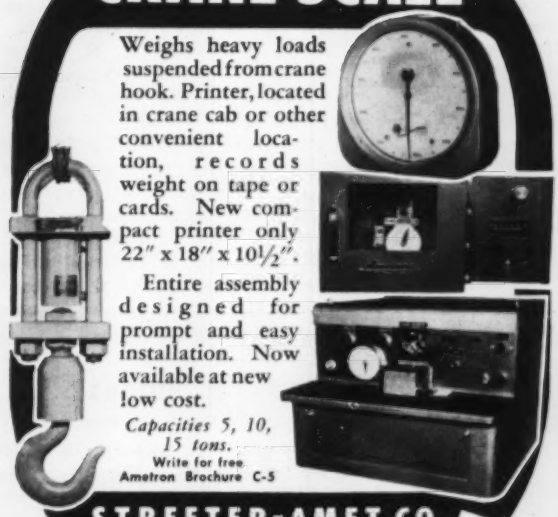

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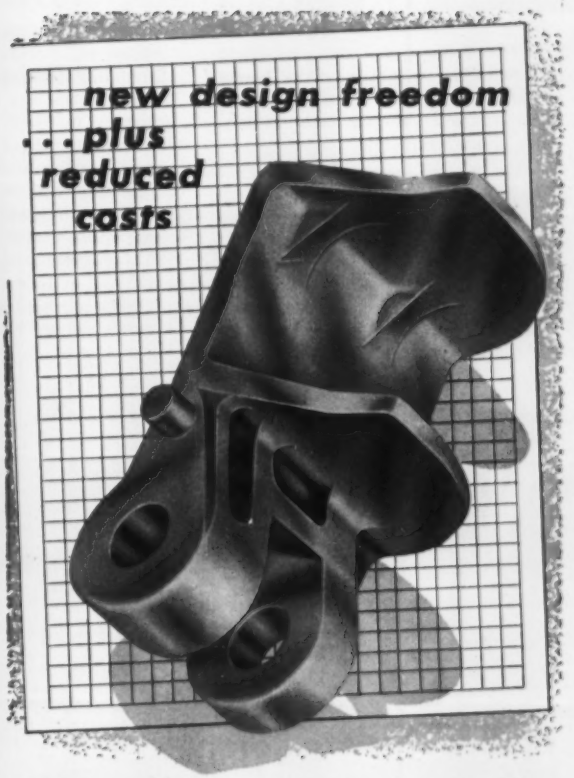

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Our engineers will be pleased to go over your parts problems with you and help cut your own costs. Why not submit parts or prints to us for quotations? Consultation is free of obligation, of course.

Write for free literature describing the investment casting process.

CASE STUDY

DESIGNATION: Female Hinge

METAL USED: Stainless Steel (AISI 302)

QUALITY CONTROL: Chemical and physical affidavits furnished. Test Bars submitted. Produced with 100% X-Ray requirements.

PARTS: Designed and cast as single unit. Formerly composed of three units welded together.

ADVANTAGES: Strengthened with re-inforcing ribs in U-Bracket. Weight decreased without decrease in strength. Reaming holes only machining required. Formerly holes countersunk outer sides only, now cast with radii on both inner and outer sides. Greatly reduced cost.

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PRECISION CASTING CORP.
66 WASHINGTON STREET • BROOKLYN 1, N. Y.
PLANTS: Brooklyn, N. Y. • Groton, Conn. • Tilton, N. H. • Los Angeles, Calif.

other users normally obtaining their supplies at Pittsburgh. The market there is described as tight, and users are scrambling to get on order books for late third and fourth quarter. Deliveries are running one to two weeks behind schedule.

Wire . . .

Wire Prices, Pages 128 & 129

Some slackening of production is expected over the summer because of vacation schedules, but, in general, the wire mills anticipate a continued steady flow of business, barring, of course, extensive labor trouble in the automotive industry.

Wire mill order books hold more third quarter volume than at the approach of the end of the two previous quarters in New England. This is true notably of producers of high carbon specialties, including spring stock. Shipments will be off in July owing to vacation production losses, but some mills in the East will dispense with suspensions in an effort to maintain deliveries.

On numerous high carbon products, orders are in excess of shipments, with little or no easing in automotive demand. Some softening in pressure is expected before long, however.

Rope volume is marked by contracts for stainless of about $1.230 million. Four producers share the tonnage, bulk of which went to the American Chain & Cable Co., Wilkes Barre, Pa., at $702,816; and Leschen Wire Rope Division, H. K. Porter Company Inc., St. Louis, at $411,930. The rope is for the Navy for non-magnetic use.

Cable wire, including galvanized for the main suspension supports of the Mackinac Straits bridge, Michigan, is being produced at the Trenton, N. J., plant of American Steel & Wire Division, U. S. Steel Corp. About 3000 tons of the 11,500 tons required have been drawn; cable spinning starts next year.

Structural Shapes . . .

Structural Shape Prices, Page 126

Structural steel bookings in April of 269,703 tons were down from the preceding month's 285,434 tons, but were second highest for this year and 46 per cent greater than in April a year ago, reports the American Institute of Steel Construction.

Total bookings for the first four months were 1,030,395 tons, against 822,845 in the like period of 1954. Backlogs as of Apr. 30 stood at 1,443,506 tons, compared with 822,845 on the like date of last year.

April shipments of 239,658 tons were the highest for the year, although off substantially from 293,532 tons in April of last year. Shipments in the first four months totaled 906,660 tons, against 1,077,645 in the like period of 1954.

Current inquiry is featured by a number of New York state bridge jobs on which bids will be closed June 23. In the East, generally, demand is livelier and several fair sized orders have been placed in the area, with substantial additional work still pending.

Backlogs of some of the larger structural fabricators have moved out deliveries to third quarter next year, but New England units are not nearly so extended, permitting most to book smaller tonnage projects on three-month delivery.

Wide flange beam capacity is taken for third quarter and more semifinished steel is needed by structural mills to meet production schedules. In New England, one off-shade hue in an otherwise bright structural picture is the price for fabricated material. Shops unwilling to shade normal profit margins are passing up considerable tonnage.

Purchasing agents say it is difficult to place structural orders for Septem-

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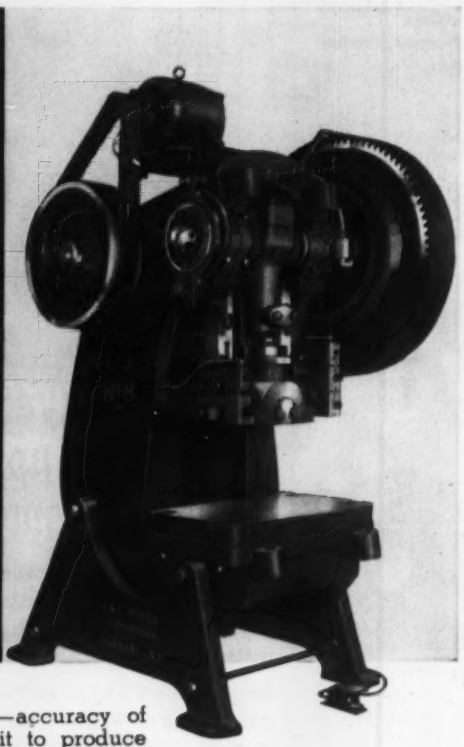
FOR MORE PRODUCTION AT LOWER COSTS



The rigidity—versatility—accuracy of this new press enable it to produce more at lower costs. It provides a new concept of efficient press operation.

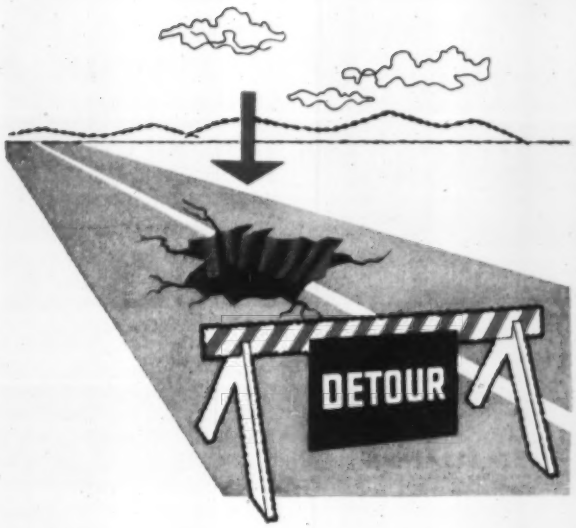
The air clutch is standard equipment on both geared and non-geared models. This provides easier and safer means for maximum practical speeds with shock-free, full-power operation. Alloy iron frame, long adjustable gibs, recessed crankshaft bearing caps, large air release—spring set brake and rugged ram adjusting screw with buttress thread and replaceable bronze seat are but a few of the features that will help to better your press operations.

Specifications

Capacity—90 tons. *Standard Stroke*—4". *Maximum Stroke* (to order)—8". *Strokes* per minute—40 (non-geared type 70). *Throat Depth* center of ram to frame—12½". *Die Space*—16½" to 24" (bed to ram, stroke down, adjustment up). *Bolster Plate Area*—38" x 24".

Write for Catalog—Fully describes all L&J O.B.I. Presses—21 geared and non-geared models. Capacities 8 to 90 tons. Also, 20 to 50 ton High Speed, Double Crank Straight Side Presses with speeds up to 450 s.p.m. Ask for Catalog L-12.

L & J Press Corporation, 1628 Sterling Ave., Elkhart, Ind.



a hole here wastes time . . .

a hole here saves time

Crucible Hollow Tool Steel Bars save time — and money too — whenever you need ring-shaped steel parts, or tools with a center hole. The tool steel is drilled through when you get it! You don't need to bore, drill, hole-saw, cut off or rough-face. That's why they cut your production time, increase machine capacity — and reduce scrap losses.

You can get these hollow bars in any of Crucible's famous quality tool steels, in almost any combination of OD and ID sizes. And you can get *immediate* delivery of five popular grades — KETOS oil-hardening; SANDERSON water-hardening; AIRDI 150 high carbon, high chromium; AIRKOOL air-hardening; and NU DIE V hot-work tool steels — from the Crucible warehouse near you.

Call your Crucible representative for the full story of how these steels can save time and money in your shop. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

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Faster cutting while maintaining smooth finish • Freedom from shedding • Perfect balance • Longer life

In conventional brushes, when faster cutting action is desired, coarser wire is used. But increasing the wire gauge causes brittleness, destroying the wearing quality of the brush, and resulting in excessive scoring of the work.

Pittsburgh has solved this problem by maintaining the same ideal gauge wire in every brush, but increasing the fill and diameter of the hub and center plate of brushes designed for faster cutting. Thus, although cutting speed is increased, work remains unscored and the wire does not lose its inherent power to flex. These Red Center brushes last longer, maintain perfect balance throughout life, and do a better job all around.

This is just one example of superior Pittsburgh construction, engineered for both general and specific applications. For details of the complete line, write for free Catalog #54-W. Address: PITTSBURGH PLATE GLASS CO., *Brush Div.*, Dept. O-6, 3221 Frederick Ave., Baltimore 29, Maryland.

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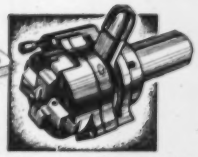

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Fifth Edition, 440 pages, Illustrated

This book brings together the combined knowledge and experience of 31 outstanding authorities and takes one step by step through steelmaking. Representing years and years of constant work and study, "ABC" is the result of actual first-hand experience. It is written in simple, non-technical language, and hundreds of photographs of operations and equipment are included. **The Penton Publishing Co., Book Department, 1213 W. 3rd St., Cleveland 13, O.**

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ber shipment. Producers at Pittsburgh are taking fourth quarter orders. Steel soon may be more freely available for shape production but current supplies are definitely tight.

Tubular Goods . . .

Tubular Goods Prices, Page 130

The outlook for a strong third quarter in steel pipe is promising. At least one major Pittsburgh area producer reports demand for specialty tubing far exceeds its ability to produce this month. Both welded and seamless tube sales continue strong, and producers have backlogs averaging about two months.

Major mills expect no slackening in consumption this summer. Sales managers, however, concede that "a lot can happen in the next 30 days." Some leveling off in buying may be experienced if labor trouble is experienced, they say.

Cast iron pipe agencies in the Pacific Northwest have sold about as much pipe in the first five months of 1955 as was expected for the entire year. Demand continues active and no letup in good business is anticipated. Largest cast iron project pending in the area involves 500 tons for a system improvement at Anchorage, Alaska.

Warehouse . . .

Warehouse Prices, Page 131

Distributors anticipate continued good business in June, although it may not be so heavy as in May, the best month this year. Normally, June begins to reflect the vacation-season lag. With higher prices expected in July and with mill deliveries falling behind schedule, it is possible that June will be on a parity with May.

There is an undetermined amount of stockpiling in preparation for a possible strike in the steel industry. This is not a major aspect of the market now, as a strike is not seriously feared. One warehouseman in Pittsburgh is building stocks in scrapyards and empty storage buildings for the purpose of supplying his customers in the event of a strike.

Over-all sales are spotty, although plates, shapes, bars and sheet are moving well. If tightness continues in those products through summer, warehousemen will be hard pressed to keep their stocks complete. The bulk of deliveries in the Pittsburgh area represents increased requirements as small business activity gains. Distributors are receiving a larger number of orders ranging around 70 to 80 tons.

More extended mill shipments, especially on cold-rolled sheets, structurals and plate, are turning some

Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season; gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$25.00-$26.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 85c-87c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$52.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

56-60%	$3.25-$3.80
65%	4.15-4.25

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Potsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa. $130; Philadelphia, $116; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¾-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.50
Camden, N. J., ovens	24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, Ind., ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	24.00
Swedeland, Pa., ovens	24.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	24.25
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Diam (Inches)	Length	Per 100 lb
2	24	$47.75
2½	30	30.75
3	40	30.00
4	40	28.50
5½	40	28.25
6	60	25.50
7	60	25.25
8, 9, 10	60	22.75
12	72	26.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25

CARBON

8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	10.25
17	72	9.85
20	84	9.85
20	90	9.65
24	72, 84	9.85
24	96	9.60
30	84	9.75
40, 35	110	9.50
40	100	9.50

volume to warehouses, but this is chiefly for nearby requirements.

Distributors are placing more forward orders with the mills, specifying September-October delivery. Their slitting, flame cutting and other fabricating departments are more active.

Pig Iron . . .

Pig Iron Prices, Page 131

Some leading sellers of merchant pig iron report May was the most active month so far this year—although much was left to be desired. Improvement is ascribed largely to protective covering because of the probability of higher prices early in the third quarter. Sellers believe that a portion of recent business has been at the expense of third-quarter tonnage. Some further protective buying may take place early this month, or up to the time when buyers no longer can place tonnage for delivery before July 1.

While shipments have been somewhat in excess of consumption, foundrymen are cautious in building up inventories. The prospect of higher prices is counterbalanced to some extent by failure of casting business to improve to expected levels. Foundry business volume lags behind other branches of metalworking industry.

Pig iron shipments to New England shops through May were close to 10 per cent heavier than in the like 1954 period, owing partly to improvement in melt by textile mill equipment builders. Demand for highway accessories (hydrants, catch basins and manhole covers) is up, but prices are making volume in this category unattractive. Jobbing shops also are operating under highly competitive conditions. A few malleable shops in the area are melting above average.

Foundry business has improved in the Cincinnati district, mainly because of better machine tool volume.

On the West Coast, foundrymen report business is improving.

Iron Ore . . .

Iron Ore Prices, Page 139

Shipments of Lake Superior iron ore in the week ended May 30 totaled 2,750,164 gross tons, reports the Lake Superior Iron Ore Association. This was the second largest weekly tonnage moved so far this year and compared with 2,557,466 tons in the like week a year ago. During the current shipping season, the lake fleet has brought down 14,604,041 gross tons of ore. The figure for the same period last year was 10,995,264 gross tons.

Indicative of how a business pickup of unexpected duration affects transportation of raw materials by steel producers, a major Pittsburgh steelmaker reports that it drew up its 1955 plans for iron ore shipment in December, 1954. Since then, they have been revised three times. Each time the amount of ore needed was figured higher.

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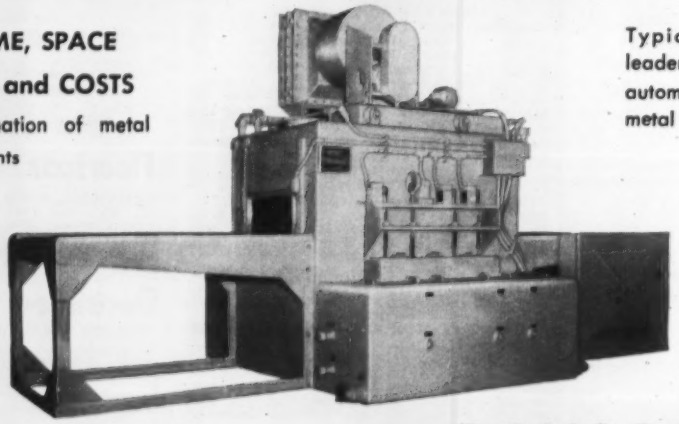

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Just roll a batch of work into the cabinet of a Ransomatic, press a button, and the work will be treated with any pre-determined sequence of solutions and rinses—thoroughly, accurately and efficiently. Can be built for any size work or any number or combination of solutions. Also built in drum type for work that can withstand rolling. Send for complete details.

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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max, 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P. 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads. 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max): Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%. Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, C 0.025% max. (Simplex 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.5c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer. (Approx. 20% Al, 40% Si, 40 Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c, F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.8c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.05. Delivered. Spot, add 10c.

Ferrotitanium—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta, deld.; less ton lots $6.30.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%), C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%), C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-26% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity, $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa., $1.24.

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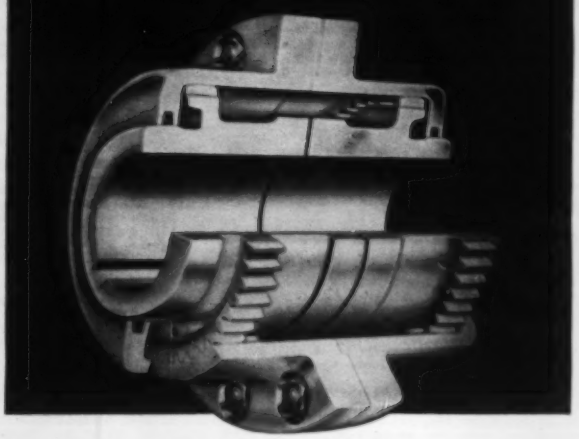

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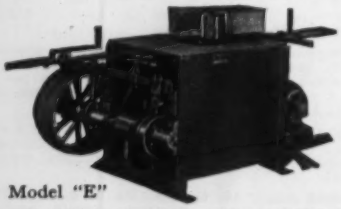

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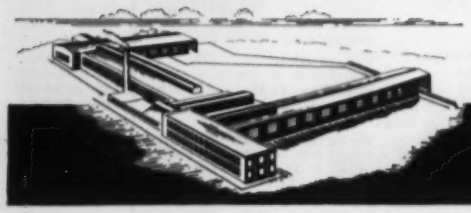

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SPRING CITY PENNSYLVANIA

Scrap . . .

Scrap Prices, Page 144

Pittsburgh—Uncertainty about the third quarter steel operating rate causes low buying of scrap. Moderate purchases of No. 1 heavy melting are reported at the prevailing price of $35. Punchings and plate scrap, as well as cut structurals and turnings, weakened last week, dropping about $1 a ton. Most mill purchasing agents are optimistic about third quarter requirements, but a strike could cut scrap buying substantially.

Cleveland—Except for one representative purchase of electric furnace material, the scrap market here and in the Valley continues at a virtual standstill. The electric furnace scrap sale brought a top price of $36, delivered, Valley. For the most part, dealers are marking time pending labor conditions in the steel and automotive industries.

Chicago—The purchase of several grades of heavy melting steel scrap by a leading local mill last week at the same prices it paid early in May has stabilized the market here. Dealers had been expecting lower prices.

Boston—Steel scrap prices are generally unchanged. Buying is slow, with usual differentials between heavy melting grades spread up to $10 a ton. Light industrial scrap prices drag at new low levels, but cast grades are slightly firmer on somewhat heavier buying in small lots. Export loading has slowed down and will be further hampered by dock repairs.

New York—Brokers' buying prices have steadied, with no change noted through the entire list. Trading is moderately brisk for both domestic and export account.

Buffalo—Although steel production here holds above the theoretical capacity rate, the local scrap market continues to show easier tendencies. New mill buying still lags. Orders are awaited to substantiate recently lowered prices. Meanwhile, the list is largely nominal.

Philadelphia — Scrap prices are easier on electric furnace bundles at $39, delivered, and on structurals and plate at $40. All other steel grades are unchanged, with the result that some leading trade interests believe the market is near bottom. In cast grades, No. 1 cupola is easier at $36-$37. The easiness is due to labor trouble at the Florence, N. J., pipe shop.

Birmingham—Steel scrap prices declined as much as $4 a ton on some grades when the two largest district buyers returned to the market with purchases of limited quantities last week. The biggest loser was No. 2 bundles. In the cast market, unstripped motor blocks were off $1 a ton, while electric furnace bundles also declined $1. The export market is at a standstill, due to a pileup of shipping at European ports.

Cincinnati—Prices are unchanged. The trade, however, expects a decline, with industrial grades showing no strength. At the moment, though, the market is stabilized.

Los Angeles—Auto wreckers, largest source of collections in this district, complain that prices are too low for profitable operation. Despite the lag in collections, scrap remains plentiful.

San Francisco—Part of a boatload of steel scrap left last week for Japan and a full cargo will leave this week. With this strong export demand, coupled with steady domestic consumption, prices are expected to hold present levels.

Seattle—An Oregon buyer has purchased considerable heavy melting scrap here at $2 a ton under published levels. The main local buyer is still paying $33 and $29, respectively, for No. 1 and No. 2, but dealers believe a $2 drop is coming.

Canada . . .

Production of primary iron and steel shapes in Canada during 1954 was 3,836,768 net tons, of which 3,742,111 tons were carbon and 94,657 tons alloy. This compares with the 1953 total of 4,738,164 tons of which 4,577,217 were carbon and 160,947 alloy.

Of 1954 output, 1,271,000 tons were delivered under producers' interchange for further processing. This compares with 1,430,908 in 1953.

Primary steel shape shipments for sale last year totaled 2,566,052 net tons, of which 2,476,377 were carbon and 89,375 alloy. Total shipments in 1953 were 3,326,137 tons, of which 3,082,815 were carbon and 153,322 tons alloy.

Production in January this year totaled 341,780 net tons, against 313,010 in December and 358,676 in January, 1954. Shipments for sale in the month were 212,402 net tons, compared with 200,987 in the preceding month and 231,661 in January a year ago.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 126

Last year, reinforcing bar producers had excess capacity: Merchant bar sales were slow, and more equipment was available for reinforcing steel production. Now, with merchant bar demand increasing, reinforcing producers are using all available capacity to meet requirements of their bar customers.

Tonnage of reinforcing bars going to construction is about equal to, or slightly above, a year ago. Total use of the product is limited by the inability of cement plants to satisfy construction demands. The cement industry's capacity is reported to be only slightly larger than it was a year ago.

While unit bids on concrete bars are slightly firmer for New England bridges, highway builders continue to bend distributors' prices downward. Several major sellers in the area are resisting the pressure, but they are booking a minor share of the heavy tonnage moving. School needs are substantial, but subject to price shading. Better than 25,000 tons bought for Massachusetts turnpike bridges were sold under price pressure. Several distributors with the heavy backlogs show the least resistance to pressure.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2200 tons, galvanized transmission tower steel, to Bethlehem Pacific Coast Steel Corp., Seattle, for Bonneville Power Administration.

1500 tons, fiber board plant, Armstrong Cork

(*Please turn to page* 146)

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

June 1	$34.67
May 25	34.67
May Avg.	34.87
June 1954	27.92
June 1950	39.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting..	34.00-35.00
No. 2 heavy melting..	31.00-32.00
No. 1 bundles	34.00-35.00
No. 2 bundles	26.00-27.00
No. 1 busheling	34.00-35.00
Machine shop turnings	*19.50-20.50*
Mixed borings, turnings	*19.50-20.50*
Short shovel turnings ..	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals, 5 ft lengths	*38.00-39.00*
Heavy turnings	33.00-34.00
Punchings & plate scrap	*38.00-39.00*
Electric furnace bundles	38.00-39.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	34.00-35.00
Heavy breakable cast..	34.00-35.00
Unstripped motor blocks	25.00-26.00
No. 1 machinery cast..	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 2 ft and under..	48.00-49.00
Rails, 18 in. and under	49.00-50.00
Rails, random lengths.	44.00-45.00
Railroad specialties ..	43.00-44.00

Stainless Steel Scrap

18-8 bundles & solids..	215.00-225.00
18-8 turnings	105.00-110.00
430 bundles & solids..	100.00-105.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer's plant)

No. 1 heavy melting..	31.00-32.00
No. 2 heavy melting..	25.00-26.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	31.00-32.00
Machine shop turnings.	14.00-15.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings ..	21.00-22.00
Cast iron borings	21.00-22.00
Low phos.	33.00-34.00
Cut structural plates 2 ft and under	38.00-39.00
Alloy free, short shovel turnings	26.50-27.50
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	37.00-38.00
Stove plate	43.00-44.00
Heavy breakable cast..	33.00-34.00
Unstripped motor blocks	25.00-26.00
Brake shoes	30.00-31.00
Clean auto cast	44.00-45.00
Burnt cast	32.00-33.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
R.R. malleable	43.00-44.00
Rails, 2 ft and under..	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, random lengths..	44.00-45.00
Cast steel	39.00-40.00
Railroad specialties	39.00-40.00
Uncut tires	43.00-44.00
Angles, splice bars	45.00-46.00
Rails, rerolling	52.00-53.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	200.00-210.00
18-8 turnings	100.00-110.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer's plant)

No. 1 heavy melting..	34.00-35.00
No. 2 heavy melting..	30.00-31.00
No. 1 bundles	34.00-35.00
No. 2 bundles	24.00-25.00
No. 1 busheling	34.00-35.00
Machine shop turnings.	16.00-17.00
Short shovel turnings ..	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	35.00-36.00
Electric furnace bundles.	*35.00-36.00*

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CHICAGO

No. 1 heavy melting..	33.00-35.00
No. 2 heavy melting..	29.00-30.00
No. 1 factory bundles..	35.00-36.00
No. 1 dealer bundles..	32.00-33.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-35.00
Machine shop turnings.	16.00-17.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings ..	18.00-19.00
Cast iron borings	18.00-19.00
Cut structurals, 3 ft ..	36.00-37.00
Punchings & plate scrap	37.00-38.00
Electric furnace bundles	35.00-36.00

Cast Iron Grades

No. 1 cupola	40.00-41.00
Stove plate	33.00-34.00
Unstripped motor blocks	29.00-30.00
Clean auto cast	44.00-45.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	45.00-46.00
Rails, 2 ft and under..	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Angles, splice bars	43.00-44.00
Rails, rerolling	51.00-52.00

Stainless Steel Scrap

18-8 bundles & solids.	220.00-225.00
18-8 turnings	95.00-100.00
430 bundles & solids..	105.00-110.00
430 turnings	45.00-50.00

Chicago Mercantile Exchange
(Week ended May 31)

	No. 1 Heavy Melting High	Low	Close
Oct.	36.00	35.75	35.75
Jan.	....	....	....

Sales (160-ton units): 1 October.
*Nominal

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	27.50
No. 2 heavy melting...	21.00
No. 1 bundles	27.50
No. 2 bundles	19.00
No. 1 busheling	27.50
Machine shop turnings.	13.00
Mixed borings, turnings	13.00
Short shovel turnings ..	16.50
Punchings & plate scrap	33.00

Cast Iron Grades

Charging box cast	28.00
No. 1 cupola	37.00
Stove plate	32.00
Heavy breakable	28.00
Unstripped motor blocks	20.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting...	32.00-33.00
No. 2 heavy melting...	28.00-29.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-33.00
Cast iron borings	17.00-18.00
Short shovel turnings..	25.00-26.00
Machine shop turnings.	19.00-20.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate ..	36.00-37.00
Structural plate, 2 ft ..	36.00-37.00
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 18 in. and under	45.00-46.00
Rails, rerolling	43.00-44.00
Rails, random lengths..	42.00-43.00
Angles, splice bars	43.00-44.00
Std. steel axles	35.00-36.00

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting...	35.50
No. 2 heavy melting...	32.50
No. 1 bundles	35.50
No. 2 bundles	26.50-28.00
No. 1 busheling	35.50
Electric furnace bundles.	*39.00**
Machine shop turnings.	21.50
Mixed borings, turnings	21.50
Short shovel turnings ..	24.00-25.00
Structurals & plate	*40.00**
Heavy turnings	34.00-35.00
Couplers, springs, wheels	40.50-41.00
Rails crops, 2 ft & under	50.00-51.00

Cast Iron Grades

No. 1 cupola	*36.00-37.00**
Malleable	44.00
Heavy breakable cast..	40.00-41.00
Drop broken machinery	44.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	30.00-31.00
No. 2 heavy melting...	27.00-27.50
No. 1 bundles	30.00-31.00
No. 2 bundles	22.00-23.00
Machine shop turnings.	12.00-13.00
Mixed borings, short turnings	13.00-14.00
Short shovel turnings ..	15.00-16.00
Low phos. (structural & plate)	34.00-35.00

Cast Iron Grades

No. 1 cupola	32.00-33.00
Unstripped motor blocks	22.00-23.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	235.00-240.00
18-8 borings, turnings	105.00-110.00
430 sheets, clips, solids.	95.00-100.00
410 sheets, clips, solids.	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	27.00-28.50
No. 2 heavy melting	*17.00-18.00*
No. 1 bundles	27.00-28.00
No. 2 bundles	16.00-17.00
Machine shop turnings.	11.00-12.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings ..	15.00-16.00
No. 1 cast	*31.00-32.00*
Mixed cupola cast	*29.00-30.00*
No. 1 machinery cast	*34.00-35.00*

BUFFALO

No. 1 heavy melting..	29.00-30.00
No. 2 heavy melting..	25.00-26.00
No. 1 bundles	29.00-30.00
No. 2 bundles	23.00-24.00
No. 1 busheling	29.00-30.00
Mixed borings, turnings	20.50-21.50
Machine shop turnings.	19.00-20.00
Short shovel turnings..	21.50-22.50
Cast iron borings	20.50-21.50
Low phos.	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	37.00-38.00
No. 1 machinery	42.00-43.00

Railroad Scrap

Rails, random lengths..	35.00-36.00
Rails, 3 ft and under..	42.00-43.00
Railroad specialties	36.50-37.50

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	31.50-32.50
No. 2 heavy melting..	27.00-28.00
No. 1 bundles	31.50-32.50
No. 2 bundles	21.00-22.00
No. 1 busheling	31.50-32.50
Machine shop turnings.	18.00-19.00
Mixed borings, turnings	17.50-18.50
Short shovel turnings ..	21.00-22.00
Cast iron borings	17.50-18.50
Low phos., 18 in.	37.00-38.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Heavy breakable cast..	35.00
Charging box cast	36.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.50-33.50
Rails, 18 in. and under	47.00-48.00
Rails, random lengths..	40.00-41.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting..	31.00
No. 2 heavy melting..	29.00
No. 1 bundles	31.00
No. 2 bundles	24.50
Machine shop turnings.	16.00
Short shovel turnings..	18.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	33.00
Heavy breakable cast..	33.00
Unstripped motor blocks	33.00
Brake shoes	30.00
Clean auto cast	43.00
Stove plate	34.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.50
Rails, 18 in. and under	46.00
Rails, random lengths.	40.00-41.00
Rails, rerolling	50.00
Angles, splice bars	41.00

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting...	33.00
No. 2 heavy melting...	29.00
No. 1 bundles	25.00
No. 2 bundles	23.00
No. 3 bundles	16.00-17.00
Machine shop turnings.	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings ..	15.00-16.00
Electric furnace, No. 1	39.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	36.00-40.00
Heavy breakable cast..	28.00
Unstripped motor blocks	30.00-32.00
No. 1 wheels	24.00-25.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap (Delivered consumer's plant)

Rails, random lengths..	34.00

LOS ANGELES

No. 1 heavy melting...	28.00
No. 2 heavy melting...	24.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings.	8.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting...	30.00
No. 2 heavy melting...	28.00
No. 1 bundles	29.00
No. 2 bundles	25.00
No. 1 busheling	30.00
Machine shop turnings.	10.00-11.00
Mixed borings, turnings	10.00-11.00
Short shovel turnings ..	12.00
Cast iron borings	12.00
Cut structurals	30.00
Heavy turnings	11.00
Punchings & plate scrap	30.00

Cast Iron Grades

No. 1 cupola	40.00-43.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

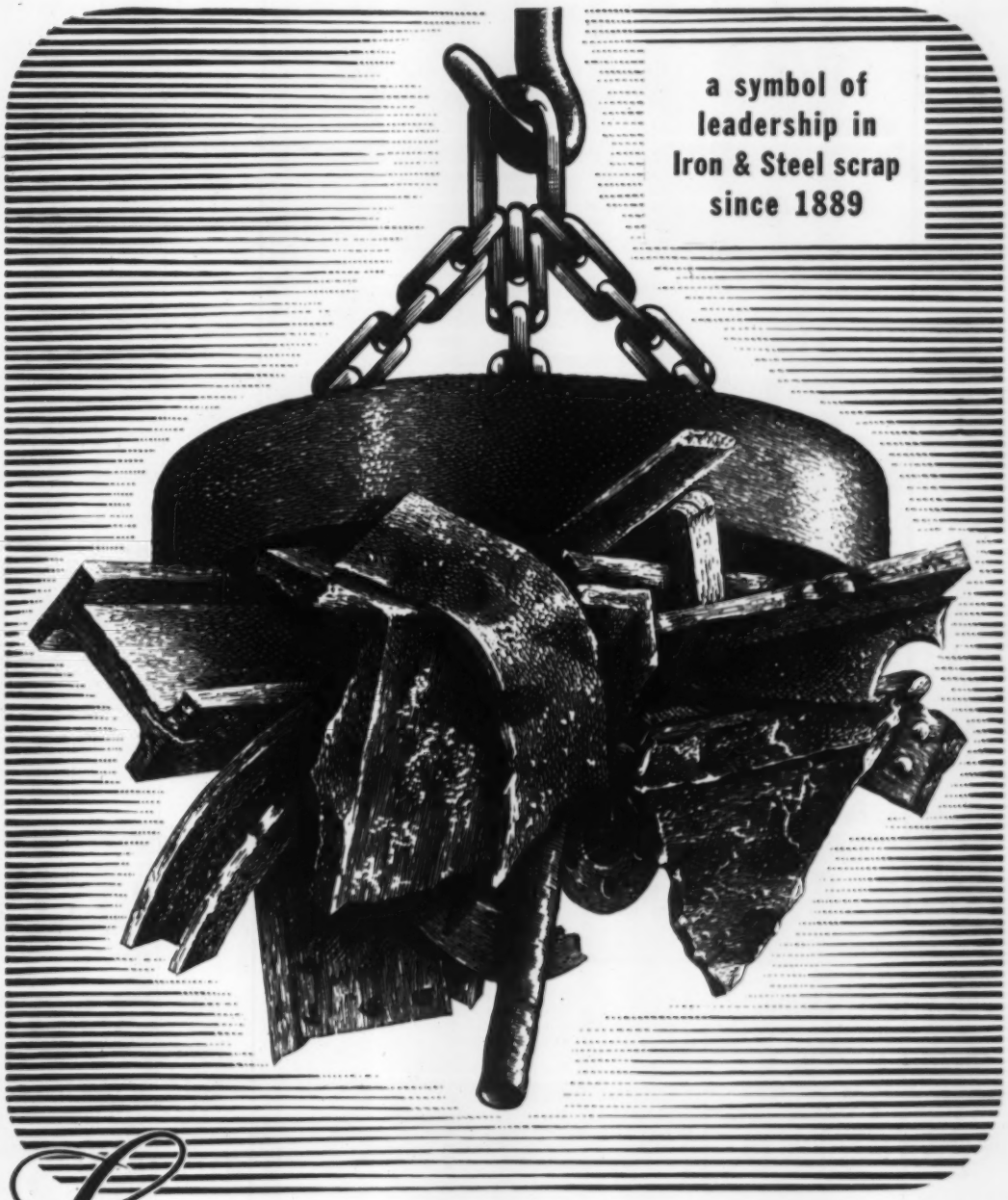
(Delivered prices)

No. 1 heavy melting...	34.00
No. 2 heavy melting...	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Mixed borings, turnings	16.00
Rails, remelting	43.00
Busheling, new factory: Prepared	32.00
Unprepared	28.00
Short steel turnings	16.00

Cast Iron Grades†

No. 1 machinery cast..	42.00-45.00

†F.o.b., shipping point.



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(*Continued from page* 143)

Co., Macon, Ga., to Bethlehem Steel Co., Bethlehem, Pa.

1300 tons, fabricating plant, Claymont, Del., for Colorado Fuel & Iron Corp., to Ingalls Iron Works, Verona, Pa.

1000 tons, warehouse, Firestone Tire & Rubber Co., Pottstown, Pa., to Mayer Pollock, Pottstown.

1000 tons, state bridge work, R-RW, Gloucester county, N. J. through Public Constructors, Pleasantville, N. J., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

600 tons, Andrew Warde High School, Fairfield, Conn., to Leake & Nelson Co., Bridgeport, Conn.; John Zandonello, Bridgeport, general contractor.

590 tons, four bridges, Massachusetts turnpike, Sturbridge, Mass., to Pine Brook Iron Works, Scranton, Pa.; Monroe-Langstroth Inc., Norwood, Mass., subcontractor for bridges.

500 tons (also 45 tons of reinforcing bars), superstructure, manufacturing plant, Tampax Inc., Rutland, Vt., to Vermont Structural Steel Corp., Burlington, Vt.

450 tons, police station addition, Portland, Oreg., to A. Young Iron Works, Portland, Oreg.; O. E. Wyman, Portland, general contractor.

435 tons, Rogers High School, Newport, R. I., to Tower Iron Works, Providence, R. I.; Dimeo Construction Co., Providence, general contractor.

424 tons, military warning project towers in Canada, to Leckenby Structural Steel Co., Seattle; Western Electric Co., prime contractor.

375 tons, state turnpike section, 37-I, Luzerne county, Pa., to Pine Brook Iron Works, Scranton, Pa.

300 tons, including bars, one and two-span WF-beam bridges, Glover, Shelburne and Londonderry, Vt., to Vermont Structural Steel Co., Burlington, Vt.

250 tons, high school, Amherst, Mass., to Haarmann Steel Co., Holyoke, Mass.; Carroll-Verge & Whipple, Inc., Pittsfield, Mass., general contractor.

235 tons, high school, Topton, Pa., through J. A. Williams Inc., general contractor, to Bethlehem Fabricators, Bethlehem, Pa.

200 tons, fish freezing and processing plants, Gloucester, Mass., equally divided, Bancroft & Martin Rolling Mills Co., South Portland, Me., and Groisser & Shlager Iron Works, Somerville, Mass.; F. W. Cunningham & Sons, Portland, Me., general contractor.

175 tons, building, Sorg Printing Co. Inc., 80 South street, Manhattan, New York, through George A. Fuller Co., general contractor, to the J & V Iron Works, Bronx, that city.

125 tons, office and factory, Roseland, N. J., through Mahoney-Troast Co., general contractor, to Dayton Metal Products Co.

125 tons, shapes and bars, school additions, Middleboro, Mass., to Tower Iron Works and Plantations Steel Co., both of Providence, R. I.; O. D. Purington Inc., Providence, general contractor.

115 tons, ice cream factory, Borden Co., for erection in Franklin county, Ohio, to Morris Co., Columbus, O.

110 tons, including reinforcing, graduate living center, Radcliffe College, Cambridge, Mass., to American Architectural Iron Co., and Quincy Ornamental Iron Co., Boston; McCucheon Corp., Boston, general contractor.

110 tons, freight warehouse, La Conner, Wash., to Leckenby Structural Steel Co., Seattle.

105 tons, preheater building, North American Cement Co., Security, Md., to unnamed fabricator.

105 tons, power house extension, Polatka, Fla., for Ebasco Services, New York, to an unnamed fabricator.

105 tons, school addition, Cheshire, Conn., to Berlin Construction Co., Berlin, Conn., and New England Iron Works, Inc., Hartford; W. J. Megin, Inc., Naugatuck, Conn., general contractor.

100 tons, plant and office building, Bristol

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COMPANY.....
ADDRESS.....
CITY.....ZONE..STATE....

Brass Corp., Bristol, Conn., to Topper & Griggs, Hartford, Conn.; H. Wales Lines Co., Meriden, Conn., general contractor.

STRUCTURAL STEEL PENDING

5865 tons, bridges, Indiana toll road, Gary, Ind.; bids June 15, Indianapolis.

2450 tons, tower steel for Bonneville Power Administration, Portland, Oreg.

1800 tons, power plant addition, Boston Edison Co., Everett, Mass.

1000 tons, maintenance hangars, etc., Ladd Air Base, Alaska.

900 tons, maintenance hangars, etc., Elmendorf Air Base, Alaska.

650 tons, Hall of Residence, New York University, Washington Square, New York, Cauldwell-Wingate low on general contract.

515 tons, bridges, Indiana toll road, Lake county; bids June 8, Indianapolis.

500 tons, branch store at Ardmore, Pa., for Snellenberg Co., Philadelphia; bids June 9.

300 tons, Cardinal Dougherty High School, Philadelphia; bids closed June 1.

300 tons, channels, General Stores Supply Office, Navy, Philadelphia; bids June 10.

205 tons, underpass and WF beam bridge, Waterbury, Vt.; bids June 10, state, Montpelier, Vt.

200 tons, junior and senior high school, Borderstown, Pa.; bids June 15.

200 tons, wide flange, General Stores Supply Office, Navy, Philadelphia; bids June 14.

150 tons, 175-ton overhead electric crane, hydroelectric power plant, Cheatham, Tenn.; bids June 24, U. S. Engineers, Nashville, Tenn.

150 tons, Quartermasters building, Ft. Dix, N. J.; bids through Army Engineers Corps, Philadelphia, June 14.

125 tons, 1-million-gal municipal reservoir, Reading, Pa., should the work go ahead on a steel rather than a concrete alternate; bids June 15.

100 tons plus, hangar and other buildings, Klamath Falls Air Base, Oreg., bids to Thirteenth Naval District, Seattle, June 21.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2465 tons, 25 bridges, Massachusetts turnpike, Stockbridge-West Stockbridge-Lee, Mass., to U. S. Steel Supply Division, U. S. Steel Corp., Cambridge, Mass.; B. Perini & Sons Inc., Framingham, Mass., general contractor.

700 tons, over and underpass structures, Northeast expressway, Chelsea, Mass., to Northern Steel Inc., Medford, Mass.; Gil Wyner & Co., Malden, Mass., general contractor.

510 tons, high school, Manchester, Conn., to Scherer Steel Co., Hartford, Conn.; M. S. Kelliher Co., Boston, general contractor; 350 tons, fabricated structural steel to City Iron Works, Hartford.

450 tons, Rogers High School, Newport, R.I., to Plantations Steel Co., Providence, R. I.; Dimeo Construction Co., Providence, general contractor.

215 tons, three bridges, Massachusetts turnpike, Sturbridge, Mass., to Truscon Steel Division, Republic Steel Corp., Boston; The Henley-Lundgren Co., Shrewsbury, Mass., general contractor.

140 tons, Andrew Warde High School, Fairfield, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; John Zandonello, Bridgeport, Conn., general contractor.

134 tons, Washington state overcrossing, Spokane, Wash., to Pacific Coast Steel Corp., Seattle.

88 tons, military installation, Chiniak, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

70 tons, storage igloos, Great Falls, Mont., to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

1335 tons, bridges, Indiana toll road, Gary, Ind.; bids June 15, Indianapolis.

300 tons, Carnation Co., processing plant, Seattle; bids May 31.

225 tons, bridges, Natchez Trace parkway,

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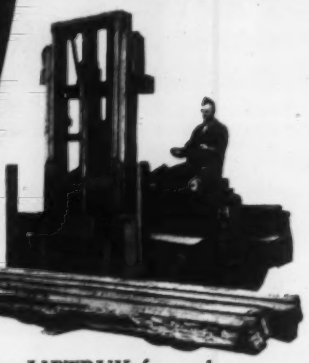

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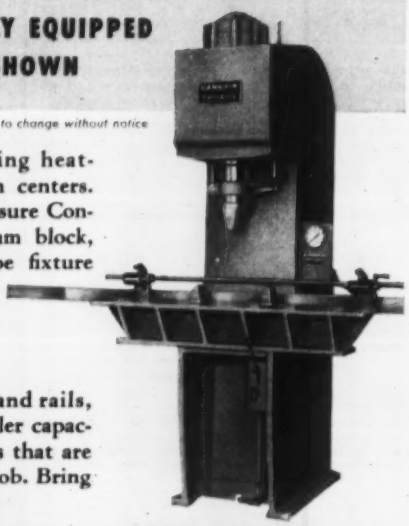

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Choctaw county, Miss.; bids May 11, Bureau of Public Roads, Florence, Ala.

200 tons plus, Oregon state highway projects; Jackson county, two bridges.

180 tons, bridges, Indiana toll road, Lake county; bids June 8, Indianapolis.

180 tons, bridges, Natchez Trace parkway, Webster county, Mississippi; bids May 12, Bureau of Public Roads, Florence, Ala.

153 tons, Washington state girder bridge, Spokane; Louis Eiterich, Port Angeles, Wash., general contractor.

104 tons, Washington state, two T-beam railroad overcrossings, King county; bids to Olympia, June 7.

100 tons, Oregon state highway bridge, Douglas county.

PLATES . . .

PLATES PENDING

1390 tons, medium tensile, General Stores Supply Office, Navy, Philadelphia; bids June 10.

1000 tons, Tacoma's Mayfield power project; bids in June 3.

600 tons, reservoir supply line, Tacoma, Wash.

250 tons, elevated water tank, Henderson, Ky., Chicago Bridge & Iron Co., Chicago, low.

100 tons plus, water standpipe, Portland, Oreg.; bids in May 26.

100 tons, fuel storage tanks, Fairchild Air Base.

100 tons, fuel storage tanks, Klamath Falls (Oreg.) Base.

100 tons, 300,000-gal elevated water tank, Glasgow, Mont., Air Base.

PIPE . . .

CAST IRON PIPE PLACED

100 tons, system expansion, Kent, Wash., to U. S. Pipe & Foundry Co., Seattle.

100 tons, system expansion, Edmonds, Wash., to U. S. Pipe & Foundry Co., Seattle.

CAST IRON PIPE PENDING

235 tons, various sizes; bids to Prosser, Wash., June 13.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chesapeake & Ohio, forty 1750-hp diesel road-switching units to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Green Bay & Western, two 1600-hp diesel road switching units, to Alco Products, New York.

Pennsylvania Railroad, 50 all-purpose diesel road-switching locomotives, 1750 hp each, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

LOCOMOTIVES PENDING

Long Island, ten diesel locomotive units; authorized by directors.

RAILROAD CARS PLACED

Missouri Pacific, 1000 steel box cars, to own shops at De Soto, Mo. This railroad also will convert 523 open-top hopper cars to covered hopper cars.

Union Tank Car Co., two-hundred 10,000-gal tank cars and two-hundred 11,000-gal tank cars to own shops.

Wabash, ninety-seven 70-ton gondola cars to its Decatur, Ill., shops.

RAILROAD CARS PENDING

New York City Transit Authority, 250 subway cars, plus 15 extra trucks and miscellaneous spare parts, under contract R-21; bids closed May 31.

Pakistan government, 121 broad gage and 85 meter-gage, lightweight steel passenger cars; bids asked, according to U. S. Department of Commerce.

Southern, 1500 seventy-ton triple hopper cars; bids asked.

Transportation Materiel Command, Marietta, Pa., 3 caboose cars; bids closed June 2.

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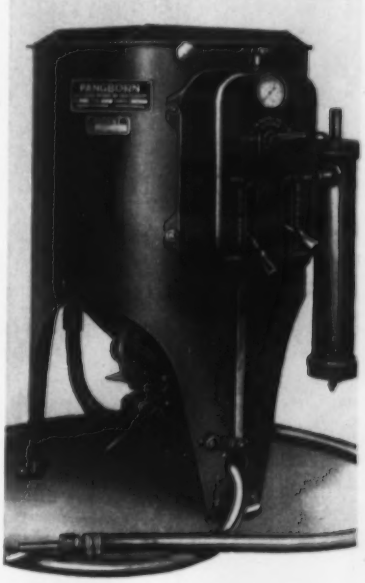

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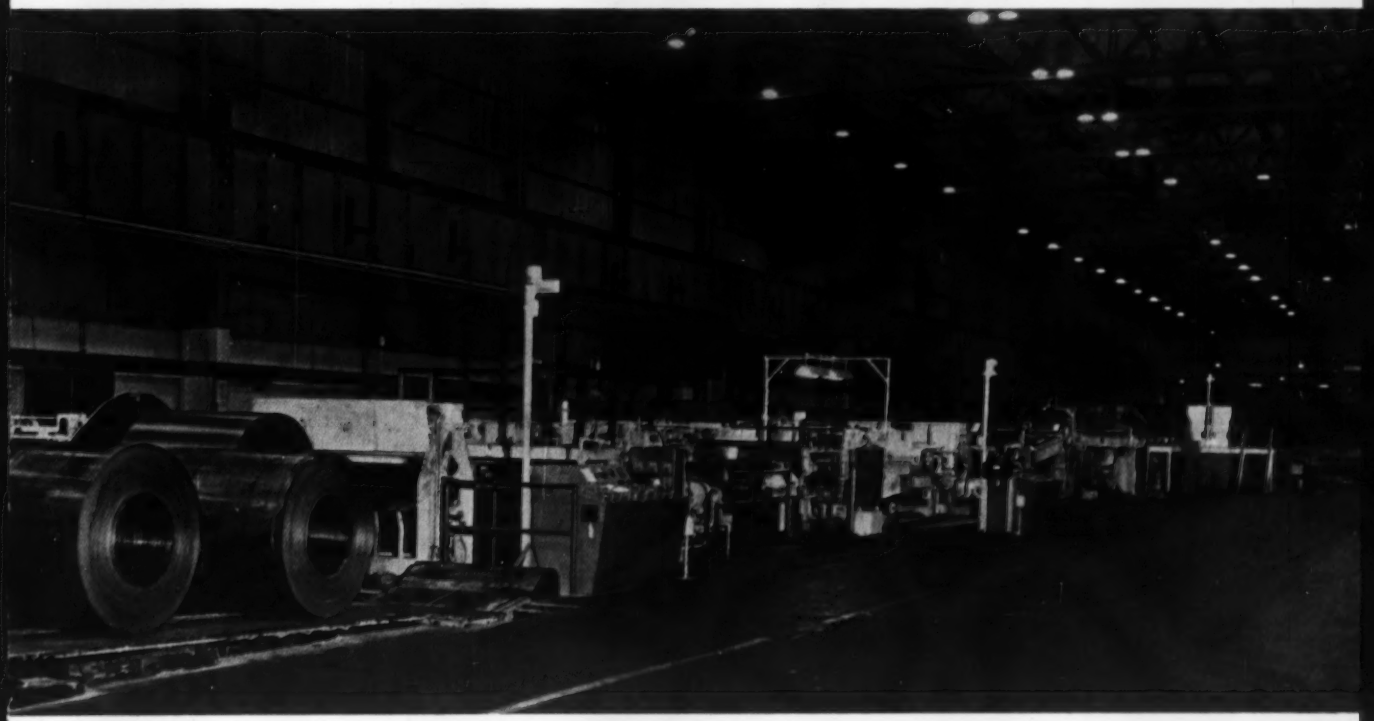
can YOUR production equipment KEEP UP WITH THIS MARKET?

★ By 1965, the experts predict there will be 80 million automobiles in existence, as compared to some 50 million now.

For that traffic load, more than 50 billion dollars will be needed to rebuild the 3,350,000 miles of existing roads and to build new super highways.

Each million dollars of highways requires between 420 and 450 tons of steel. Each automobile averages about 3,500 pounds of steel, plus many pounds of copper, brass, aluminum, rubber and plastic.

Will you lose out competitively on this big market on poor quality of product or slow production equipment? Good equipment brings down production costs and improves product quality.



Aetna-Standard designs and builds equipment for producing, processing and fabricating steel, copper, brass, aluminum, rubber and plastic. Here is one example—an 80" Sheet Side Trimming and Shearing Line at the Fairless Works, U. S. Steel Corporation. Other Aetna major product lines include: Pipe Mills (Seamless and Butt Weld); Continuous Coating Lines; Rolls; Drawbenches; Machinery for Rubber and Plastic.

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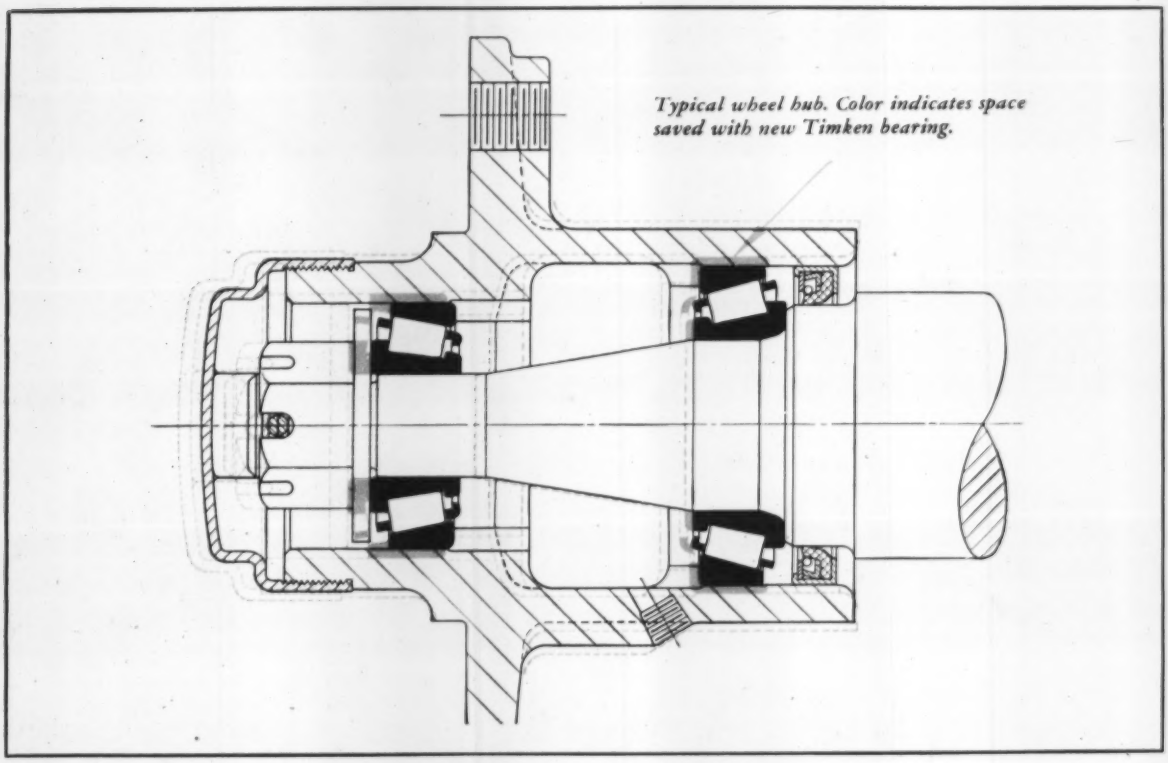
GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

Three new TIMKEN® bearings cost less, permit savings in related parts, too



Typical wheel hub. Color indicates space saved with new Timken bearing.

New capacity-packed bearings take up less space than previous designs of same bore sizes

THREE new Timken® tapered roller bearings are now available in bore sizes of ¾", 1¼" and 1⅜". And they cost less than previous bearings of the same bore sizes. Because they take up less space and weigh less, they permit application designs that save in related parts, too. And never has so much bearing capacity been packed into so little space.

These new Timken bearings offer exciting opportunities for savings through redesign of present tapered roller bearing applications. One example is shown in the above diagram of a typical wheel hub. Seals can be smaller and cheaper, hubs can require less metal and less machining, spindles can be made shorter and less costly to machine. All these savings are in addition to the lower cost of the bearings themselves.

Many engineers have already taken advantage of these possibilities and well over 1,000,000 of the new bearings are proving themselves in automobile front wheels and other applications.

The new Timken bearings also make it possible for you to enjoy the advantages of tapered roller bearings in many new applications—and at minimum cost.

Auxiliary parts for use with the new Timken bearings are available from the Timken Company and major closure manufacturers. For full information on the new low-cost Timken bearings and help in designing them into your product, write today to The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

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